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Contents

India's Performance in the World Competitiveness Scene

S.S. Sharma, N.K. Nair & A.K. Barman

The Geneva based World Economic Forum (WEF) brings out a Global Competitiveness Report every year. And so does the Lausanne (Switzerland) based International Institute for Management Development (IMD) which publishes the World Competitiveness Yearbook. These reports arrive at the comparative rankings of major national economies across the world based on their respective competitiveness indexes, computed by taking in to account various socio-economic criteria/ factors. This paper presents the comparative performance of India according to these and other related studies.

S.S. Sharma is Director General and N.K. Nair & A.K. Barman are Director (Research) & Deputy Director (Research) respectively in the National Productivity Council. This is a modified version of the theme paper presented at the NPC-FICCI-SCOPE-NCAER Conference on National Competitiveness Policy, New Delhi, 5-6 April, 1999.

Introduction

"Hard nosed Competition is the best assurance of a healthy business".

–Donald M. Kendall
Former Chairman and CEO, Pepsico

Competitiveness is the name of the hottest economic game nowadays. The importance of competitiveness is due not only to its direct connection with economic success in the market place at the micro level but also to the growing realization of its extraordinarily close links with economic growth at the macro level and consequently the socio-economic well-being of the people. This is equally true for developed and developing countries – in fact more so for the latter, if they have to have a reasonable chance of narrowing the gap between the two, and addressing the potentially explosive problems associated with appalling poverty, continuing economic backwardness and high unemployment. A race is on all the time and companies and countries constantly need to direct all their energies towards becoming more competitive. With the commencement of the WTO regime following the successful conclusion of the Uruguay Round, it has become a truly global race. No country or company can afford not to join this relentless race. Not only the winners in this race are promised huge economic gains, the losers are likely to face the dire risk of going out of business. Therefore, competitiveness is a win-lose game.

For a long time, it was thought that competitiveness is a matter which concerned only the companies competing in the market place and all the academic thinking and management efforts went into developing and implementing strategies which made them more competitive; the classical thinking did not perceive much of a role for the state. However, it is being increasingly seen, particularly following the path-breaking work by Michael Porter (1990) that improvement in macro economic

environment by the state and strengthening the micro-economic foundations of economic development have to go hand-in-hand with micro level efforts to improve competitiveness by individual enterprises. This has led many countries to search for optimum policies and new initiatives which will spur and reinforce the efforts of its business enterprises to be more competitive in a rapidly changing global setting. For example, Australia set up an independent commission which submitted its report on National Competition Policy in 1993. Singapore came out with its report on National Competitiveness Policy in 1998, while the U.K. published its White Paper on National Competitiveness in December, 1998. These developments indicate the kind of seriousness being accorded to the crucial question of competitiveness by countries which are widely perceived to be already well ahead of us in the race for competitiveness so that they can stay ahead of the pack snapping at their heels.

Unfortunately, India is a late starter and therefore has a lot of ground to cover. A beginning was made in 1991 following the economic crisis which over took us in that year by embarking up on a process of economic reforms which has been trying to gain momentum since then by fits and starts. The policy of extensive controls and high protection that were followed until then have left us far behind in this race for competitiveness. The immediate gains following the introduction of economic reforms were nothing short of spectacular; the rate of economic growth immediately zoomed up to unprecedented levels. The recent slow down clearly indicates the need to sustain, and if possible step- up, the growth rate experienced in the recent past by taking a leaf out of the books of the more successful countries to evolve a set of policy initiatives. This is also needed at the enterprise level to make our business entities competitive in the domestic as well as in the international markets.

The recent slow down clearly indicates the need to sustain, and if possible step-up, the growth rate experienced in the recent past.

Competitiveness Reports

The Geneva based World Economic Forum (WEF) is bringing out a global Competitiveness Report (GCR) every year. And so does the Lausanne (Switzerland) based International Institute for Management Development (IMD) which publishes the World Competitiveness Year Book (WCY). While the Confederation of Indian Industries (CII) serves as the Partner Institute in India for GCR, the National Productivity Council (NPC) is the Partner Institute for WCY.

Competitiveness in GCR has been defined as the ability of a national economy to achieve sustained high rates of economic growth in the medium term on the basis of suitable policies, institutions and other economic characteristics. WCY defines competitiveness as the ability of a nation to provide an environment that sustains the competitiveness of enterprises.

These reports arrive at the comparative rankings of major national economies (53 by GCR and 46 by WCY) across the world based on their respective Competitiveness Indexes, computed by taking into account various socio-economic criteria/factors. In constructing these indexes, two sets of data are combined. The first, quantitative data, related to the indicators of a country's economic performance, technological capabilities and infrastructure is based on varying published sources including the national accounts tables. The second, the survey data, comes from the Executive Opinion Surveys conducted every year. For the 1998 reports, responses from about 2000 executives for GCR and over 4000 executives for WCY from the covered countries were analyzed. The information from these surveys is based on the perceptions of the business community about each country's characteristics that are not fully captured by the quantitative data.

Factors of Competitiveness

For the quantitative data in GCR and hard data in WCY, indicators were chosen so as to provide a reasonably comprehensive view of the overall state of a country's economy, including from both macro economic and micro economic sources. The questionnaires for the executive surveys in both the reports are based on a comprehensive view of what the leading businessmen perceive as happening in their respective countries, with a special emphasis on questions for which alternative quantitative data are not available. Once assembled, these data, both quantitative and survey, are classified and distributed into various competitiveness factors. There are eight broad factors of competitiveness taken in both the reports. (Tables 1 and 2):

Taking into consideration the complex set of factors/criteria on which the reports are based, it is obvious that a nation's competitiveness is not merely of having free markets alone. Nor is it governed by reduced taxes and duties. There are many factors that may enable or retard the competitiveness of a country. They range from macro-economic policies, presence of institutions,

educational systems and the like to micro policies at the level of the firm.

It is obvious that a nation's competitiveness is not merely of having free markets alone. Nor is it governed by reduced taxes and duties.

Table 1: Factors of Competitiveness in GCR, 1998

Factor	Description	Weightage
Openness	Openness to foreign trade and investment, openness to foreign direct investment and financial flows, exchange rate policy and ease of exporting.	(1/6)
Government	The role of the state in the economy. This includes the overall burden of government expenditures, fiscal deficits, rates of public saving, marginal tax rates and the overall competence of the civil service.	(1/6)
Finance	Efficiency of the financial intermediaries to channel savings into productive investment, the level of competition in financial market, the perceived stability and solvency for key financial institutions, levels of national savings and investment and ratings given by outside observers.	(1/6)
Infrastructure	The quality of roads, railways, ports, telecommunications, cost of air transportation and overall infrastructure investment.	(1/9)
Technology	Computer usage, the spread of new technologies, the ability of the economy to absorb new technologies and the level and quality of research and development.	(1/9)
Management	Overall management quality, marketing, staff marketing, staff training and motivation practices, efficiency of compensation schemes and the quality of internal financial control systems.	(1/18)
Labour	The efficiency and competitiveness of the domestic labour market. It combines a measure of the level of a country's labour costs relative to international norms, together with measures of labour market efficiency (e.g. obstacles to hiring and firing of workers), the level of basic education and skills and the extent of distortionary labour taxes.	(1/6)
Institutions	The extent of business competition, the quality of legal institutions and practices, the extent of corruption and vulnerability to organised crime.	(1/18)

Table 2: Competitiveness Input Factors (WCY, 1998)

Domestic Economy	28 criteria	Macro-economic evaluation of the domestic economy.
Internalization	40 criteria	Extent to which the country participates in international trade and investment
Government	43 criteria	Extent to which government policies and practices are conducive to competitiveness.
Finance	20 criteria	Performance of capital markets and quality of financial services.
Infrastructure	30 criteria	Extent to which natural, technical and communication resources are adequate to serve the basic needs of businesses.
Management	34 criteria	Extent to which companies are managed in an innovative, profitable and responsible manner.
Science & Technology	20 criteria	Scientific and technological capacity.
People	44 criteria	Availability and qualifications of human resources.

Note: A performance score is created by normalizing every country's value using standard deviation method. The score for each of the criteria is added for each country to build the overall score which is then ranked. All the hard data have the same weight of 1. The weight of the survey data is computed in such a way that the weight of the total survey data represents one third of the overall weight.

Competitiveness Rankings

The 1998 competitiveness rankings by the GCR (Table 3) show the world's most competitive economy to be Singapore, followed by Hong Kong SAR and the United States. Singapore and Hong Kong owe their rankings to the fact that they score high on all the sub-factors. Both the economies continued to be organized around open trade and finance, small government, sound infrastructure, rigorous enforcement of commercial contracts and low levels of corruption. This is not true to the same extent in the case of the remaining Asian economies such as Indonesia, Malaysia, Thailand and India, all of which have fallen in the ranking in 1998 from their previous levels. India which had an overall ranking of 45 out of 52 countries in 1997 slipped to 50 out of 53 in 1998.

As per the World Competitiveness Yearbook (1998), USA, Singapore and Hong Kong have retained the 1st, 2nd and 3rd place respectively (Table 4). Most of the Asian countries have low rankings except China which improved from 27th in 1997 to 24th in 1998. India remained at 41 out of 46 countries covered. Japan with a rank of 18 compared to 9th in 1997 and Thailand with 39th rank compared to 29th in 1997, suffered the biggest drop.

Table 3: Ranking of Countries as per GCR (1998)

Country	Overall Ranking		Openness		Government		Finance	
	1998	1997	1998	1997	1998	1997	1998	1997
Singapore	1	1	3	3	2	1	2	1
Hong Kong SAR	2	2	4	1	1	2	3	4
United States	3	3	12	6	21	17	4	3
United Kingdom	4	7	15	10	19	27	1	2
Canada	5	4	5	4	17	24	6	5
Taiwan	6	8	13	12	7	8	10	11
Netherlands	7	12	2	7	32	30	8	7
Switzerland	8	6	16	25	14	9	9	6
Norway	9	10	6	28	15	16	5	10
Luxembourg	10	11	1	2	18	19	7	19
Ireland	11	16	9	9	8	22	25	29
Japan	12	14	28	37	20	20	13	15
New Zealand	13	5	19	24	22	7	19	12
Australia	14	17	26	15	29	25	15	18
Finland	15	19	18	11	30	37	17	17
Denmark	16	20	17	19	34	38	26	28
Malaysia	17	9	30	16	3	6	12	6
Chile	18	13	33	20	5	3	20	24
Korea	19	21	35	38	13	10	11	9
Austria	20	27	7	35	38	40	23	26
Thailand	21	18	14	8	4	4	27	13
France	22	23	21	22	44	47	16	14
Sweden	23	22	20	18	45	49	22	27
Germany	24	25	11	21	40	41	31	33
Spain	25	26	24	13	33	33	14	21
Portugal	26	30	8	23	36	36	29	30
Belgium	27	31	23	17	43	48	21	22
China	28	29	45	48	11	12	18	16
Israel	29	24	42	33	41	44	32	31
Iceland	30	38	32	27	24	32	44	47
Indonesia	31	15	22	5	6	5	35	25
Mexico	32	33	34	31	26	21	42	40
Philippines	33	34	39	39	10	13	39	35
Jordan	34	43	43	32	16	29	24	20
Czech Republic	35	32	27	26	37	31	30	23
Argentina	36	37	38	42	23	18	34	39
Peru	37	40	37	41	9	14	45	50
Egypt	38	28	31	36	25	15	38	34
Vietnam	39	49	47	53	12	11	50	43
Turkey	40	36	25	29	46	42	51	49
Italy	41	39	10	14	47	52	37	37
South Africa	42	44	46	49	31	28	28	32
Hungary	43	46	41	46	48	46	33	41
Greece	44	48	29	43	42	51	48	51
Venezuela	45	47	36	40	28	25	41	44
Brazil	46	42	49	47	35	39	49	45
Colombia	47	41	44	34	39	35	46	48
Slovakia	48	35	48	30	53	34	36	36
Poland	49	50	40	44	50	43	43	46
India	50	45	53	51	27	23	40	38
Zimbabwe	51	51	52	52	49	45	47	42
Russia	52	53	50	50	52	52	51	52
Ukraine	53	52	51	45	52	53	53	53

(Table 3 Contd.)

Country	Infrastructure		Technology		Management		Labour		Institutions	
	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997
Singapore	2	2	2	1	7	7	2	3	2	9
Hong Kong SAR	1	1	17	21	14	13	2	1	7	19
United States	3	3	3	2	1	1	10	7	9	15
United Kingdom	7	14	13	15	15	16	5	12	2	3
Canada	6	4	4	4	5	3	27	15	6	8
Taiwan	23	28	10	17	12	18	3	3	23	28
Netherlands	5	15	9	12	3	4	17	28	10	4
Switzerland	16	12	12	11	6	5	7	16	12	10
Norway	21	6	11	13	22	8	18	17	5	7
Luxembourg	10	17	20	20	11	9	14	10	18	21
Ireland	15	23	5	6	9	11	8	19	15	11
Japan	12	7	6	8	10	6	4	9	21	13
New Zealand	13	11	14	9	17	12	6	5	8	12
Australia	4	5	8	7	18	19	20	25	14	23
Finland	11	18	1	3	13	14	46	47	3	14
Denmark	9	10	21	18	4	10	19	23	4	1
Malaysia	14	8	29	23	31	20	26	20	27	26
Chile	19	9	28	28	19	25	11	13	19	22
Korea	27	21	23	26	28	29	13	14	33	32
Austria	20	29	22	22	16	17	31	31	17	6
Thailand	33	19	35	40	35	34	28	24	36	43
France	8	16	16	14	21	24	45	42	13	18
Sweden	17	13	15	5	2	2	41	41	16	20
Germany	18	20	19	16	8	15	44	44	11	2
Spain	25	27	26	27	23	22	47	38	24	25
Portugal	22	31	38	45	46	36	15	22	28	16
Belgium	34	30	18	24	20	26	38	49	26	27
China	39	40	39	37	45	43	12	8	35	24
Israel	35	24	7	10	30	28	23	18	22	17
Iceland	29	38	27	48	34	41	30	37	20	29
Indonesia	31	22	47	29	52	32	25	6	49	37
Mexico	36	39	37	38	27	31	9	11	43	49
Philippines	40	32	46	35	26	23	16	32	45	46
Jordan	44	51	45	53	41	53	42	46	25	47
Czech Republic	46	45	34	30	50	44	22	21	42	34
Argentina	30	36	42	39	32	35	39	43	48	39
Peru	41	44	50	51	43	45	21	26	40	42
Egypt	43	41	36	19	42	21	36	39	42	5
Vietnam	28	34	33	31	44	51	24	35	29	45
Turkey	26	25	25	32	29	33	34	33	31	38
Italy	42	42	31	33	25	30	51	51	39	31
South Africa	24	26	30	34	33	37	53	52	46	50
Hungary	32	37	24	25	36	42	50	53	34	36
Greece	37	33	44	43	37	39	37	40	37	40
Venezuela	448	46	52	40	40	48	49	50	52	51
Brazil	47	47	40	41	24	27	35	34	38	33
Colombia	45	43	49	49	38	40	32	29	50	53
Slovakia	38	35	41	42	47	46	33	27	47	35
Poland	49	50	32	44	48	50	43	48	41	44
India	50	48	43	36	39	38	48	30	32	30
Zimbabwe	52	53	51	47	49	47	29	4	44	41
Russia	51	52	52	50	51	49	40	36	51	52
Ukraine	53	49	53	46	53	52	52	45	53	48

Table 4: Competitiveness Rankings by Country and Input Factors as per WCY (1998)

Country	Overall Ranking		Domestic Economy		Internationalization		Governmentt	
	1998	1997	1998	1997	1998	1997	1998	1997
USA	1	1	1	1	1	1	13	7
Singapore	2	2	2	3	2	2	1	1
China Hong Kong	3	3	17	9	3	3	2	2
Netherlands	4	6	13	16	6	6	17	22
Finland	5	4	20	23	11	13	15	15
Norway	6	5	7	8	15	23	12	13
Switzerland	7	7	28	32	17	26	8	5
Denmark	8	8	14	18	12	9	20	23
Luxembourg	9	12	11	4	4	5	11	24
Canada	10	10	12	21	22	19	7	9
Ireland	11	15	6	5	7	12	6	12
United Kingdom	12	11	19	19	5	4	10	8
New Zealand	13	13	30	34	16	22	4	3
Germany	14	14	21	26	8	7	36	25
Australia	15	18	25	22	27	28	9	14
Taiwan	16	23	8	17	32	30	14	20
Sweden	17	16	26	31	14	11	35	38
Japan	18	9	15	6	34	32	27	28
Iceland	19	21	10	7	38	39	18	19
Malaysia	20	17	3	2	24	17	3	4
France	21	19	36	29	10	10	42	35
Austria	22	20	37	27	25	18	32	26
Belgium	23	22	32	28	9	8	45	43
China Mainland	24	27	5	14	20	29	5	6
Israel	25	26	27	15	33	34	33	36
Chile	26	24	4	10	23	16	16	10
Spain	27	25	31	33	18	14	23	21
Hungary	28	36	42	44	26	21	26	39
Portugal	29	32	35	40	13	15	29	30
Italy	30	34	29	30	19	27	44	44
Argentina	31	28	24	37	21	20	30	17
Philippines	32	31	23	20	28	31	19	11
Turkey	33	38	38	35	31	36	38	33
Mexico	34	40	22	41	40	38	25	29
Korea	35	30	34	13	46	45	34	32
Greece	36	37	33	38	35	33	43	40
Brazil	37	33	39	25	39	41	21	16
Czech Republic	38	35	43	36	29	24	40	41
Thailand	39	29	16	12	37	25	22	18
Indonesia	40	39	9	11	36	35	27	27
India	41	41	18	24	42	43	28	31
South Africa	42	44	40	42	45	46	31	34
Venezuela	43	45	45	46	41	42	39	42
Colombia	44	42	44	43	44	40	41	37
Poland	45	43	41	39	43	44	46	45
Russia	46	46	46	45	30	37	37	46

(Table 4 Contd.)

Country	Finance		Infrastructure		Management		Science & Technology		People	
	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997
USA	1	1	1	1	1	3	1	1	8	12
Singapore	10	6	15	11	2	1	9	8	1	5
China Hong Kong	9	12	19	19	4	2	25	18	13	13
Netherlands	2	2	8	12	3	4	11	12	9	10
Finland	8	13	3	3	5	8	6	6	3	1
Norway	11	11	2	2	13	12	20	11	4	4
Switzerland	3	3	11	9	12	9	5	5	7	6
Denmark	4	4	5	5	8	5	14	23	2	3
Luxembourg	5	7	16	17	16	16	18	17	14	18
Canada	12	10	6	6	11	10	12	9	6	2
Ireland	15	20	23	22	10	12	8	7	19	20
United Kingdom	6	8	17	16	18	14	17	14	25	23
New Zealand	17	15	13	13	9	11	23	16	15	8
Germany	7	9	7	7	20	25	3	3	21	19
Australia	14	18	9	8	17	19	21	24	10	14
Taiwan	19	23	26	28	7	18	7	10	18	21
Sweden	13	14	4	4	6	6	15	21	17	17
Japan	23	5	21	20	24	7	2	2	11	11
Iceland	25	26	10	10	21	23	26	31	5	7
Malaysia	28	19	24	27	22	17	24	25	34	33
France	16	16	14	15	23	20	4	4	23	25
Austria	20	21	12	14	25	21	22	19	12	9
Belgium	18	17	18	18	15	22	16	15	20	15
China Mainland	42	40	40	40	30	34	13	20	24	31
Israel	27	30	22	24	19	24	10	13	16	16
Chile	24	24	34	25	14	15	34	33	32	34
Spain	21	22	25	21	28	28	30	27	27	26
Hungary	30	38	20	23	35	40	27	28	30	29
Portugal	22	27	32	35	39	43	38	43	31	32
Italy	29	34	28	32	26	27	31	35	26	27
Argentina	32	31	29	30	40	35	40	37	36	28
Philippines	40	28	44	44	27	30	32	29	40	38
Turkey	26	25	39	38	31	36	35	38	39	39
Mexico	39	42	33	26	33	38	45	46	38	40
Korea	45	43	31	34	34	26	28	22	22	22
Greece	34	33	37	37	36	32	33	34	29	30
Brazil	41	41	42	41	29	29	36	36	37	36
Czech Republic	36	35	27	29	42	42	37	44	28	24
Thailand	44	29	41	42	41	31	43	32	35	37
Indonesia	35	39	38	39	44	41	42	41	44	44
India	33	37	46	45	32	39	29	30	45	45
South Africa	31	36	35	33	38	37	39	40	46	46
Venezuela	37	32	30	31	45	45	46	45	42	42
Colombia	38	44	43	43	37	33	41	39	43	43
Poland	43	45	36	36	43	44	44	42	41	35
Russia	46	46	45	46	46	46	19	26	33	41

There is a great deal of similarity in the approaches adopted by the two reports. The main factors chosen for measuring the competitiveness are broadly similar including "openness" (GCR) called "internationalization" by WCY and/when" (GCR) called 'people' by WCY. The results of the two reports are almost similar with minor differences, some of which are mentioned below:

Country	GCR	WCY
U.K.	4	12
Germany	24	14
Taiwan	6	16
Italy	41	30
Indonesia	31	40
Japan	12	18
Thailand	21	40
India	50	41

The difference in ranking of India can be partly explained by the fact that five of the seven countries ahead of India in GCR are not covered by WCY and Thailand is ranked at 21st in GCR but at 48th in WCY.

India's Competitive Position

India fares quite poorly on the individual factors and, therefore, in the overall Competitiveness Index according to the GCR. This is true, even when India's performance is compared with other Asian and developing countries. The overall ranking in 1998 has come down to 50 from 45 in 1997. All the other Asian countries except China suffered lower rankings in 1998 mainly due to the effects of the Asian financial crisis, yet remained ahead of India in overall ranking. The best score by India has been in respect of Government (27), much lower than all the remaining Asian countries including China. This is followed by Institutions (32), higher than all Asian countries except Malaysia.

China suffered lower rankings in 1998 mainly due to the effects of the Asian financial crisis, yet remained ahead of India in overall ranking.

As per the WCY, India has lost out to China in seven out of the eight broad factors. The only grace seems to be in the case of Finance where India was ranked at 33 against the rank of 42 for China among the 46 countries taken for evaluation. China seems to have improved its overall position mainly because of the performance in the domestic economy, and factors related to internationalization such as international trade and related issues like import tariff, trade balance, image of the country in the eyes of outsiders, etc. For example, China's image abroad is rated much higher than the case of India; 13 against India's 43. India's ranking in terms of the overall competitiveness index has been showing a downward slide in recent years, from 38 in 1994 to 41 in 1998 as against China which improved its position from 34 in 1994 to 24 in 1998 (Fig.1). In the 1998 GCR executive survey, India has been ranked 27th as against 24th rank it received during 1997. Among the Asian countries that have been ranked lower than India are Indonesia at 28th position (19th in 1997) and the Philippines at 38th (30th in 1997) (Table 5). China had a ranking of 9th (10th in 1997) according to the survey. This again proves that China's image abroad is higher than that of India.

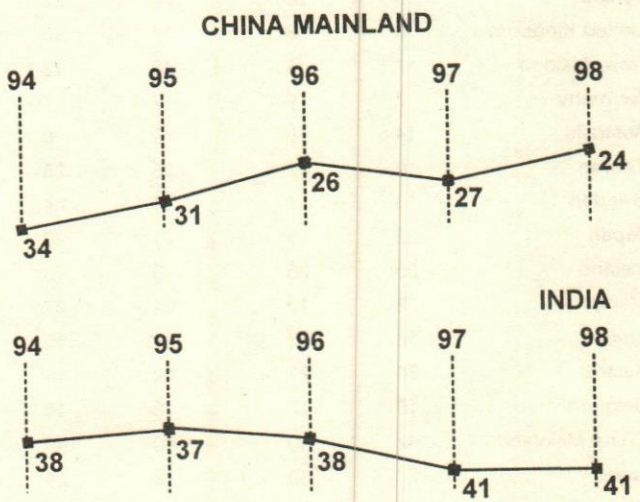

Fig. 1. National Competitiveness Trends (Overall Performance)

China's image abroad is much higher than the case of India; 13 against India's 43.

Table 6 summarizes several sub-categories where India is perceived either as especially strong, or as especially weak. The table also shows China's position as compared to India in these sub-categories. The business respondents note mainly four areas of strengths in the case of India (Nirupam Bajpai & Jeffery D. Sachs, 1998). First, the Indian stock market is seemed to be an important area for new enterprise financing in contrast to many other developing countries including China. Second, India is strong with regard to science and engineering capabilities, with a large pool of scientists and engineers and strong education in maths and science. The young talent in India is also greatly attracted towards engineering as a profession. Thirdly, India is ranked high in terms of

Table 5: Ranking by Respondents in the Executive Survey (GCR 1998)

Country	Rankings	
	1998	1997
Japan	2	2
Germany	3	4
United Kingdom	4	8
Singapore	5	3
Hong Kong SAR	6	7
Taiwan	7	6
Canada	8	12
France	9	10
China	10	9
Korea	11	5
Switzerland	12	13
Netherlands	13	16
Italy	14	14
New Zealand	15	17
Malaysia	16	11
Australia	17	20
Sweden	18	22
Ireland	19	33
Spain	20	27
Chile	21	15
Brazil	22	21
Thailand	23	18
Norway	24	28
Denmark	25	25
Mexico	26	23
India	27	24
Indonesia	28	19
Israel	29	26
Finland	30	40
Belgium	31	34
Austria	32	32
Russia	33	37
Luxembourg	34	29
Argentina	35	39
Czech Republic	36	31
Turkey	37	44
Philippines	38	30
South Africa	39	38
Poland	40	36
Vietnam	41	34
Hungary	42	41
Portugal	43	45
Egypt	44	47
Greece	45	50
Venezuela	46	42
Colombia	47	43
Slovakia	48	46
Peru	49	48
Iceland	50	52
Ukraine	51	49
Jordan	52	51
Zimbabwe	53	53

having good business schools to train managers and have abundant labour force. Fourth, Judiciary is highly rated as being independent and compliance with court rulings by the government is high. The private or public sectors can take recourse to the courts for challenging the actions taken by the Government.

All the factors of strength discussed above are overshadowed when we take into account the weaknesses. Despite having a strong stock exchange, the financial markets are perceived as highly deficient. The overall sophistication of financial markets, whether in trading in stocks or in computerization of banks, is regarded as low. This is important in view of the financial turmoil in the East Asian countries. The administrative regulations and bureaucratic methods of functioning seem to hamper business activities in India. Besides, government servants are subject to political pressures. In public administration, China is rated higher than India; China has been able to streamline its administrative regulations/procedures including reduction/elimination of the state subsidies. In India, state subsidies are found to be protecting the old and non-viable business units. Perhaps, the most striking is in respect of infrastructure where India is at the bottom of the list in a large number areas taken into consideration, be it roads, ports telecommunications or power (Table 7).

Even in the case of Research and Development, India fares no better. Not only the expenditure on R&D is very low, there is no serious collaboration between the research institutions and user industries. China extends more importance to collaborative research than what has been done by India. Perhaps, this is the reason why China could be granted more than 1500 patents in 1995 (about 2500 in 1993) compared to only 400 in the case of India (above 300 in 1993). There is not much enthusiasm on the part of Indian firms to commercialize the research done by the institutions. This is ironic in view of the fact that India is acknowledged for its scientific and engineering capabilities. Further, labour market in India is judged to be ineffective in view of the rigid labour laws. There are severe restrictions on hiring and firing of labour by the firms. Lastly, the business executives point to the fact that corruption and bribery are very rampant for getting permits and sanctions for doing business in India.

Labour market in India is judged to be ineffective in view of the rigid labour laws.

One of the most striking factors for any country is to develop international brand names for their products.

Table 6: 1998 India's Strengths and Weaknesses – GCR (1998)

		Scale*	Rank**	Scale*	Rank**
		India		China	
I	**Strengths**				
	Stock market				
	Stock market is important for new financing	5.42	13	4.38	32
	Science and engineering				
	Schools excel in basic science and math	5.27	16	4.69	26
	Country has large pool of competent scientists and engineers	6.37	1	4.56	35
	Engineering as a profession greatly attracts young talent	6.26	1	4.08	43
	Labour force				
	Country has first class business schools to train managers	5.05	8	3.26	49
	Country has an abundant labour force	6.77	1	6.67	3
	Rule of Law				
	Judiciary is independent of the government	5.40	9	3.28	47
	Compliance with court ruling is high	5.37	14	4.16	40
	Firms have recourse to courts for challenging government actions	5.56	19	3.95	42
II	**Weaknesses**				
	Financial markets				
	Citizens prohibited from investing in foreign stocks bonds and bank accounts	1.60	53	3.29	49
	Financial sector sophistication is lower than international norms	2.74	43	2.50	48
	Venture capital is scarce	2.63	50	3.94	20
	Public Administration				
	Administrative regulations that constraint business are pervasive	2.90	47	3.42	36
	Government subsidies keep old industries alive	2.68	52	4.08	25
	Civil service is subject to political pressures	2.65	43	3.62	26
	Tax evasion is rampant	2.27	48	2.97	31
	Infrastructure				
	Overall infrastructure is far worse than major trading partners	1.92	53	2.73	47
	Road infrastructure constraints business development	1.85	53	3.27	41
	Port facilities are underdeveloped	2.18	53	3.10	44
	Direct Dial phone service is prohibitively expensive	2.94	53	3.33	50
	Country suffers from severe power shortages	1.94	53	4.01	48
	Research and Development				
	The business sector spends little on R and D	2.11	52	2.95	29
	Research collaboration does not exist between universities and industry	2.66	53	3.95	25
	Firms fail to commercialize academic research	2.66	51	3.10	31
	Companies are poorly adapted to absorbing new technologies	2.29	34	3.70	46
	Labour regulations				
	Average workers are unproductive	2.94	51	3.19	48
	Hiring and firing practices are severely restricted	2.16	53	4.04	23
	Labour regulations impede adjustment of working hours to meet changes in demand	2.58	49	3.74	33
	Corruption and bribery				
	Extra payments connected with permits and licenses are common	2.79	48	3.18	45
	International brand names				
	Companies who sell internationally have their own brand names	3.81	49	4.56	30

Note: * All questions have scale from 1 (lowest) to 7 (highest).

** India's rank amongst 53 countries considered in the 1998 GCR.

Table 7: Select Indicators of Infrastructure Based on WCY (1998)

	Description of the Indicator	India	China	Top	Bottom
1.	Density of Road Net work (Km per Sq. Km)	0.62(25)	0.16(34)	4.71 (Singapore)	0.04 (Russia)
2.	Density of Rail Road Network (Km per Sq. Km)	0.012(28)	0.005(34)	0.119 (Czech)	– (Iceland)
3.	Air Transportation (1000 Passengers carried)	13255(20)	51770(4)	571072 (USA)	639 (Luxembourg)
4.	Electricity Cost to Industrial Consumers (US $ per Kwh.)	0.059(13)	–	0.022 (Iceland)	.157 (Japan)
5.	Arable Area (Sq. Mtrs per capita)	1814(28)	785(36)	26786 (Australia)	3 (Singapore)
6.	Investment in Telecommunication (percentage of GDP)	0.82(14)	1.86(4)	5.96 (Venezuela)	00 (Turkey)
7.	Computers in use (per cent share of world wide computers)	0.77(18)	1.73(9)	33.61 (USA)	0.03 (Iceland)
8.	Computers Per capita (Nos. per 1000 People)	3.0(46)	5(45)	450(USA)	(India)
9.	Computer Power (Share of Worldwide instruction per second)	0.61(19)	1.57(10)	38.11 (USA)	0.03 (Iceland)
10.	Computer Per Capita (Millions of instructions per second per 1000 population)	235(45)	473(44)	52395(USA)	(India)
11.	Connections to Inter-net (No. of hosts per 1000 population)	0.01(46)	0.02(45)	63.14 (Finland)	(India)
12.	Telephone lines (No. of main lines per 1000 population)	17.9(46)	55.5(43)	685.4 (Sweden)	(India)
13.	Cellular Mobile Telephones (No. of Subscribers per 1000 population)	0.8(46)	10.7(41)	418.7 (Finland)	(India)
14.	International Telephone Cost (US $ per 3 mts. in peak hrs. to USA/Europe from USA)	5.69(44)	6.65(45)	0.36 (USA)	6.75 (Philippines)
15.	GDP and Energy Consumption (Real GDP growth minus energy consumption growth %)	–57,38(46)	–4.24(36)	13.50 (Czech)	(India)
16.	Energy Intensity (Commercial energy consumption per $ of GDP K. Joules),	31108(41)	49179(44)	2646 (Hong Kong)	82302 (Russia)
17.	Green House Index (Carbon Heating Equivalents tons per capita)	0.5(1)	0.6(3)	(India)	3.3 (USA)
18.	Carbon dioxide emissions (tonnes per $ 1 million GDP)	2837(39)	5524(42)	128 (Indonesia)	24344 (Russia)

Note: Figures in brackets are the ranks out of 46 countries.

This helps not only in improving the image of the country, but also in exports, besides attracting foreign direct investments. China has been more successful in developing international brand names than India. In terms of companies who sell internationally, having their own brands, India has been ranked by GCR at a disappointing 49th as compared to China which has been ranked at 30th. It is important to note that India's corporate sector has not been able to succeed in developing the brand equity for their products. This reflects also our lack of concern to strike a quality image, largely due to the poor linkages between the research institutions and the business units.

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Microeconomic Foundations & Economic Growth

There exists a strong relationship between the micro economic foundations and macro economic performance, both in terms of company operations and national business environment according to Michael Porter (1998) in GCR. Porter has taken such microeconomic variables as demand conditions, related and supporting industries, local rivalry and information infrastructure, physical infrastructure, administrative infrastructure and the like in his analysis. To explore the collective impact of all these micro variables, Porter employs a common factor analysis to provide a single composite picture of the relative microeconomic competitiveness of each country by weighting all the variables. The Microeconomic Competitiveness Index

(MICI) is different from the Competitiveness Index, to the extent it focuses exclusively on microeconomic variables and addresses the level of GDP per capita rather than on its rate of growth. Porter's study shows that currently South Africa, Vietnam, India, Turkey, China, Finland, Germany and Chile under-perform compared to what their micro economic fundamentals warrant. Porter also shows that the performance of China and India may be pulled down by the large populations outside the mainstream economy. In both these countries, the macro fundamentals are in place to support higher levels of GDP per capita. If micro foundations can be preserved (e.g. South Africa, India) or enhanced while macro circumstances improve, the results offer promise for the future.

Porter combined MICI growth and the macro variables into a single equation which explained 46-48 per cent of the variations in growth, controlling for the initial income levels. According to his findings, micro and macro variables have roughly equivalent but complementary power. Therefore, while macro policies are, no doubt, important for growth, so are the sound micro foundations. He also found through his regression analysis that among the low income countries, growth in GDP per capita is strongly linked statistically to communications, infrastructure costs and quality, administrative regulatory burden, tariff liberalization, openness to foreign investors and the intensity of local competition. The intensity of local competition, which was not significant in explaining the level of GDP per capita for low income countries, is found to be highly significant in explaining the growth in GDP per capita.

When MICI is employed to rank the economies in terms of their microeconomic foundations, the US comes out the leader, followed by Finland and Netherlands. It is interesting to compare the MICI ranking with the ranking in terms of Competitiveness Index. While the Competitiveness Index is focussed on growth and encompasses both macroeconomic and microeconomic variables. MICI is exclusively microeconomic and more closely related to GDP per capita level. The rankings are correlated but exhibit some substantial differences. Almost all the Asian countries ranked much lower in terms of MICI than in terms of the Competitiveness Index ranking except India. China (42 against 28), Philippines (45 against 33), Indonesia (51 against 31), Thailand (37 against 21), Malaysia (27 against 17), Japan (18 against 12) and Korea (28 against 19) had lower rankings in terms of MICI than the corresponding ranking in terms of Competitiveness Index. India ranked 44 against 50 (same as in 1997 Competitiveness Index ranking) was only 2 ranks lower than China in terms of MICI.

Microeconomic fundamentals also bear on the rate of growth in productivity that an economy can achieve over a sustained period of time. A subset of the variables related directly to productivity growth as well as its current level, notably the intensity of competition, buyer and supplier quality, business information availability, intellectual property protection, R&D and infrastructure. Among the company variables, innovation capacity, attention to staff training, control of international distribution channels and breadth of international markets are found to be linked to productivity growth.

From the above discussion, it is clear that micro economic reforms are equally important as macro economic policy reforms. Without micro reforms, growth in GDP per capita will not be sustainable. Appropriate micro reforms, which will boost the level and growth of productivity, can also greatly ease the challenge of meeting fiscal obligations and reducing macroeconomic distortions. A greater focus on micro reforms will pay another important dividend. While macro reforms, most inevitably, inflict hardships in the short and medium terms, micro reforms can produce tangible and visible benefits. Breaking up local cartels and monopolies can lower the cost of food, housing, electricity, telephone service and other elements of cost of living. Regulatory reform can rapidly begin to ease inefficiencies, reduce pollution and eliminate unsafe practices. Political, macroeconomic and microeconomic policies therefore must be integrated to a more textured view of competitiveness as the sources of sustained prosperity.

It is clear that micro economic reforms are equally important as macro economic policy reforms.

Competitiveness & Convergence

It has been observed that there is a positive relationship between the Competitiveness Index and economic growth; more competitive countries tend to grow faster. Additionally, the economic growth literature suggests that growth should be related not only to competitiveness, but also to income level of the country, with poorer countries tending to grow faster than the richer ones. In other words, if two countries have similar levels of competitiveness, the lower of the two will tend to grow faster and thereby catch up with the richer country (Frederic Hu and Jao Zhang, 1997). The converse is also true, that if two countries have the same level of income, the one that is higher in Competitiveness Index tend to grow faster. This seems to be the case when we compare China and India.

The GCR points out that there would be higher expected rate of return on investment in poorer countries due to lesser availability of capital per worker than in rich countries which will induce capital flow from advanced countries to poorer countries. There would also be dividends for late comers in terms of more opportunities for technological catching up and creation of opportunities for low income countries for achieving faster economic growth and catching up with high income countries. The poor countries may stay permanently poor if they miss the opportunities for catch up. As described earlier, given the level of initial income, countries with high Competitiveness Index scores tend to grow faster than countries with low scores. Therefore, countries that adopt policies which are competitive in nature should achieve higher rates of growth and better possibilities for convergence regardless of their initial income levels.

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It is in the above context of convergence and competitiveness, that the examples of China and India seem to be more appropriate. Despite China and India having identical income levels in 1980 (about 4 per cent of the US level), due to much faster growth, China has reached twice the level of India's (about 12 per cent of the US level). This is mainly because China adopted the competitive policies (economic reforms) about a decade earlier than India. Such policies helped not only China but also many other countries in reducing the gap between the developed countries and the developing ones in terms of per capital income. This has also helped in attracting foreign direct investments into these countries.

Foreign Direct Investment

Higher sustainable growth rate is perhaps the best antidote for removing poverty and unemployment and for generating revenues needed to supply public goods and other vital public services. Therefore, policy planners and development economists have been arguing in favour of achieving and maintaining growth rates of 7 to 8 per cent per annum in the case of India. However, this would require higher levels of investment (about 30 per cent of GDP for achieving a 7 per cent growth and about 35 per cent of GDP for a target of 8 per cent growth). Therefore, the gap in savings and investment is necessarily to be made up by Foreign Direct Investment (FDI) rather than resorting to debt and deficit financing as this is not a sustainable solution. At the current level of savings of about 23 per cent of GDP as per the latest Economic Survey (1999), India has to mobilize FDI worth about 7 per cent of GDP. This seems to be a distant goal as the present figures shown in Table 8 indicate.

Table 8: Country-wise (Select) Foreign Direct Investment Flow

Country	FDI as Percentage of Domestic Investment		FDI as Percentage of GDP	
	1980	1996	1980	1996
China	0.0	11.6	0.0	4.9
India	0.2	2.7	0.0	0.7
Indonesia	1.0	11.1	0.2	3.5
Korea	0.0	1.3	0.0	0.5
Malaysia	12.5	11.0	3.8	4.5
Mexico	4.1	10.9	1.1	2.3
Pakistan	1.4	5.7	0.3	1.1
Philippines	–1.1	5.7	–0.3	1.7
Thailand	2.0	6.9	0.6	1.3

Source: World Bank (1998).

Though India is one of the top ten recipients of FDI in 1997, its achievement is no where comparable with that of China. As revealed by the World Development Indicators Report 1998 (World Bank, 1998), India received 3 per cent of the total FDI as against 31 per cent by China. India's FDI as percentage of total investment in the country is only about 2.7 against more than 11 per cent in a majority of East Asian countries including China. During 1996, our FDI to total GDP constituted a meager 0.7 per cent against 4.9 per cent, 3.5 per cent, 4.5 per cent, 2.3 per cent and 1.7 per cent, for China, Indonesia, Malaysia, Mexico, Philippines and Thailand respectively. "India is a better investment destination than its destination suggests. India's pitiful $ 2 billion in foreign direct investment could be $ 20 billion", commented Percy Barnevik, Chairman, Investor AB.

The FDI not only helps in raising the investment level in a country, it has also the additional benefits of introducing new technology and advanced business techniques and practices into the economy along with assured linkages with the world markets. The flow of FDI does not depend on having free market alone but also on many other factors. Though the Government has announced various liberalization measures in order to attract FDI albeit by fits and starts, India seems to be less successful when compared to its Asian counterparts.

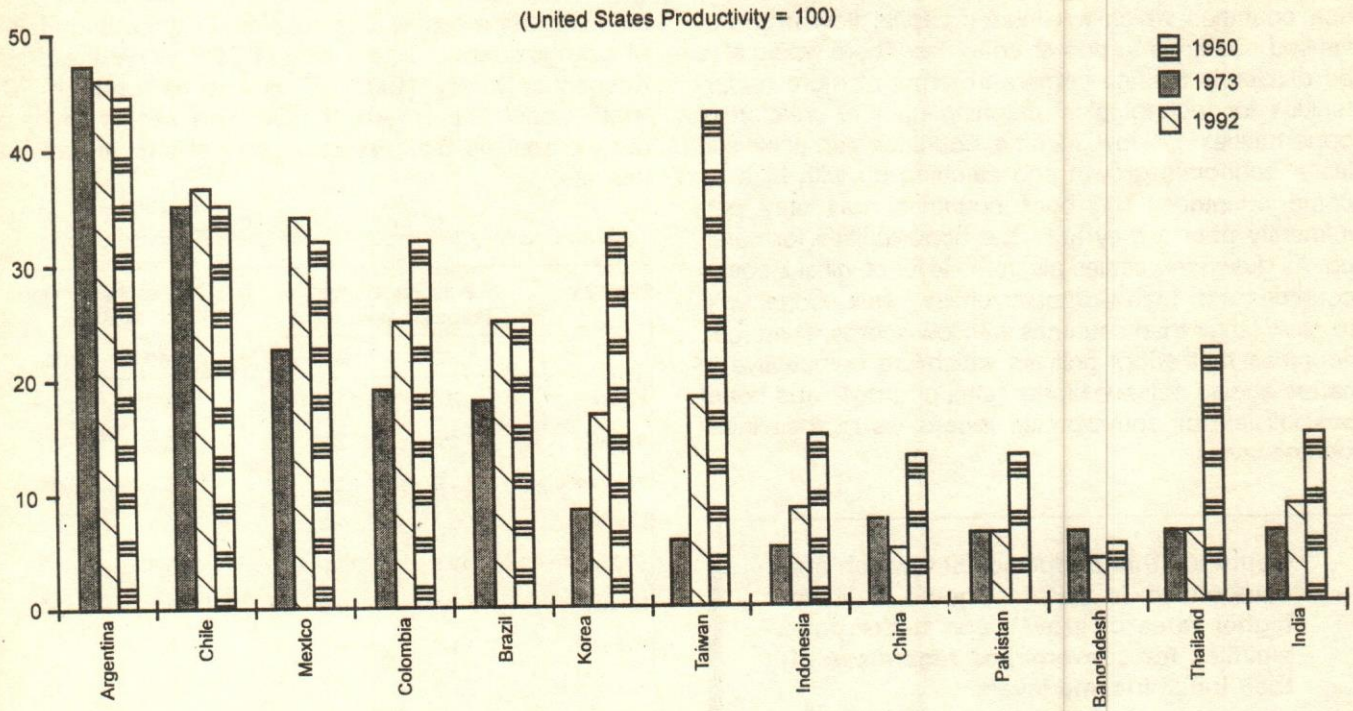

Fig. 2. Productivity Levels in Selected Developing Countries,1950-1992, Relative to those in the United States

The lack of transparency in the bureaucratic and administrative procedures, delays in decision making, corruption and bribery, rigid labour laws, infrastructure bottlenecks, lack of proper antitrust policy, etc. seem to have affected the flow of FDI into the country adversely.

Low Productivity Growth

It is now around fifty years since India embarked on the path of planned economic development. While there are significant areas of achievements (e.g. space and nuclear technologies, green revolution, diversification of the industrial base, S&T infrastructure), what is disappointing is that not only the comparative level of productivity has remained low in India (Fig. 2), but even its rate of growth has been slow (Table 9). This at once shatters the myth repeated ad nausea by the protagonists to make it appear as if low wages constitute an unbeatable 'comparative advantage' for attracting FDI and enterprises using India as a manufacturing base. Besides, the share of labour costs in total costs had significantly declined in world manufacturing scene in recent years.

What is disappointing is that not only the comparative level of productivity has remained low in India, but even its rate of growth has been slow.

Table 9: Average Growth Rates in Labour Productivity during 1986-95 (%)

	Agriculture	Manufacturing	Total Economy
Republic of China	5.89	7.31	7.06
India	3.25	4.95	3.35
Indonesia	2.52*	5.13*	6.24*
Japan	2.42	3.47	2.52
Republic of Korea	5.58	9.29	6.42
Malaysia	7.26	4.66	5.78
Nepal	3.71	–	4.91
Pakistan	2.43	8.65	2.76
Philippines	0.77	0.52	1.00
Sri Lanka	5.10	3.51	4.59
Singapore	–	9.45	6.37
Thailand	6.48*	5.83*	9.01*

* 1986-94.

Source: Based on Asian Productivity Organisation (1997).

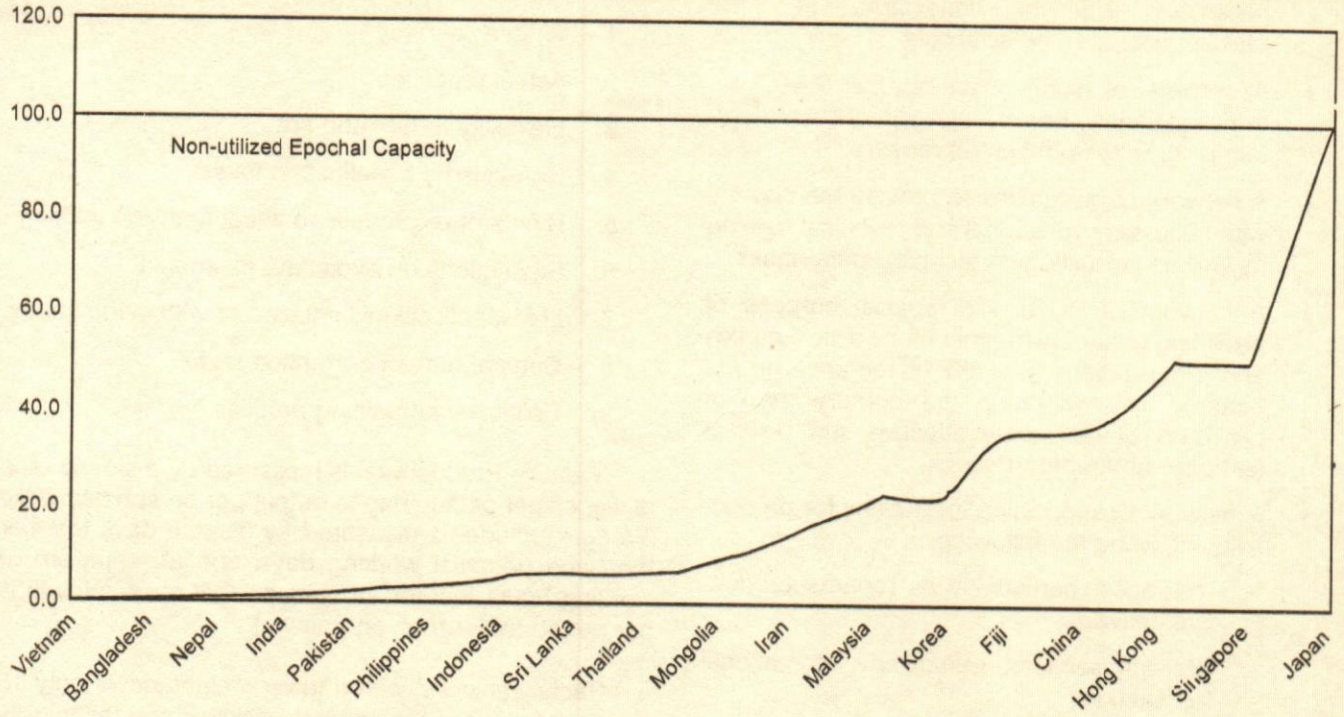

Fig. 3. Capacity Utilisation in APO Countries

Recent studies undertaken by IMF (Ajay Chopra *et al*, 1995) have shown that contribution by the total factor productivity (TFP) to the growth of the Indian economy has not been very impressive especially during the period 1960-80. While TFP (Solow Residuals) was growing at a low rate of 0.3 per cent in India during the period, it was as high as 1.2 per cent in the case of OECD countries, and 1.9 per cent in the case of East Asian countries. While the TFP accounted for only 9.7 per cent of the growth of Indian economy during the period (the rest coming from capital investment and labour input), the corresponding share was as high as 32 per cent in the case of OECD countries. However, there is evidence to the effect that, of late, the TFP has been growing at an impressive rate of 2.3 per cent per annum in India during the period 1980-88, accounting for about 47 per cent of the output growth against only 25 per cent in the case of OECD and East Asian countries. Latest studies (NPC Research Division, 1997; Dhananjayan and Sasikala Devi, 1998) reveal that the TFP continues to grow in a majority of Indian industries at least up to 1993-94 witnessing the possible positive impact of liberalisation on organisation wide performance in the economy.

Low Epochal Capacity Utilization

Following the studies by Simon Kuznets and others, Hossain Azimi (1999) has evolved what is called "epochal capacity utilization" which is very low in the case of India (Fig. 3). For this purpose, the world level of labour productivity in terms of epochal capacity is reckoned at 70000 US dollars per individual worker taking in to consideration the situation in developed countries (the countries that have been able to successfully institutionalize new social values and to form their human capital). At this level, India's epochal capacity utilization would be below 5 per cent. To move out of such an abysmal level, the study recommends to concentrate on institutionalization of new social values as well as provision of socio-political and economic environment for creating human capital in developing countries. The necessary ingredients identified are:

- A well developed system of primary and secondary education for all children. Major concern of such an educational system must be to effectively "socialize" the children and to deeply familiarize them with relevant set of social values of the new world.
- A network of higher institutes for theoretical research in various fields of studies. Major aim of

India's epochal capacity utilization would be below 5 per cent.

India is well above the average with the rank of 14 and in regard to technical skills, it is just the average.

Corruption – An Anathema

Corruption or 'unauthorized or irregular payments' as it is referred to in popular economic literature, is perceived to be widely prevailing as a result of an unholy alliance between 'neta-babu-lala' clique, which is out to hold on to or even further their vested interests through foul means, because of the realization that they cannot succeed in fair competition against more productive and efficient fellow humans. Once considered as contributing to productivity by speeding up decision making, corruption has been shown by the studies to be detracting from productivity by adding to the cost of doing business and adversely affecting the ability to attract FDI. In international comparisons undertaken by reputed organisations and scholars, India comes out poorly and is clubbed among the ten countries with high levels of corruption by the Transparency International (Fig. 4).

India comes out poorly and is clubbed among the ten countries with high levels of corruption.

There may be innumerably a large number of reasons why we could not eradicate a serious socio-economic malady like corruption. Highly concentrated power structures with sweeping discretionary authority at higher levels could be one major factor that has contributed to the pitiable state of affairs today. Progressive economic liberalization supported with undiluted transparency is the ultimate and credible solution to the malady. Economic reforms initiated since 1991, which certainly is a welcome beginning in this context, lost its momentum since mid nineties. Many of the redundant power centers are still intact, while new ones are coming up every year, thereby checkmating the progress towards fair competition. Further, it is seldom that a culprit is put on trial. Instances of punishments are rarer

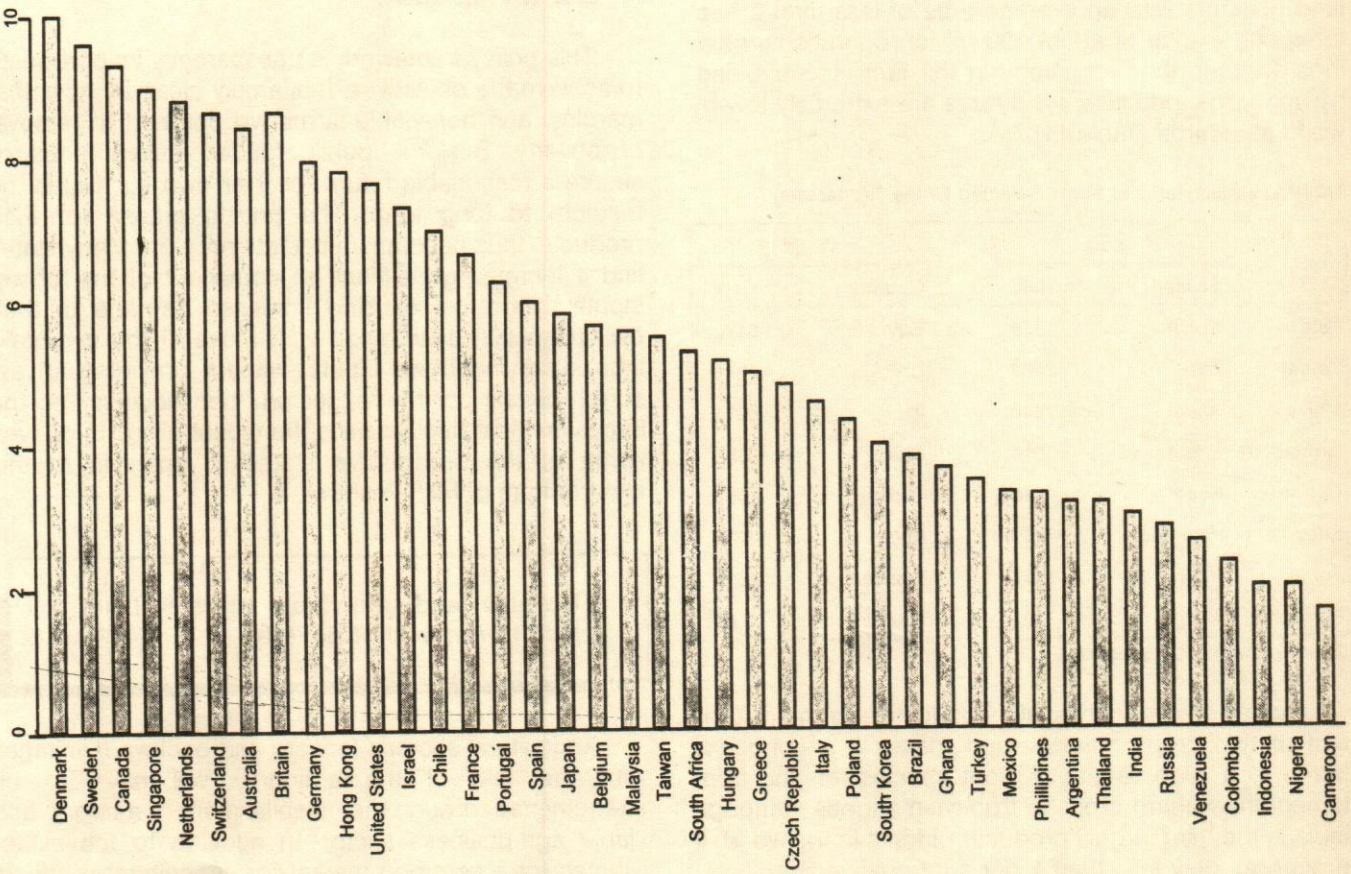

Fig. 4. Corruption Index (Where 10 = least corrupt)
(*Source:* Transparency International)

agricultural export policy is an imperative if agricultural exporters are to penetrate the world markets in order to secure remunerative price margins.

Environment & Competitiveness

Many business leaders and policy makers feel that stringent environmental regulations may affect their international competitiveness (Theodore Panayatou, 1997). While according to conventional wisdom, strict environmental regulations lead to loss of market share in the short run and migration of polluting industries to countries with less stringent/enforcement, according to Michael Porter (1990) their impact is not only benign but may have significant positive effects on competitiveness by promoting efficient input use, total quality management and technological innovation—the same basic approach as for enhancement of productivity. Environmental regulations also stimulate the growth of new markets for green products, environmental services and pollution control technologies (total business $ 350 billion estimated to double by 2000 AD), which more than offset any negative impact of regulations on "dirty" industries. Accordingly, countries with more stringent environmental regulations are more likely to develop a competitive advantage for environmental technology/services and green products.

Building in sufficient flexibility in the environmental standards may be less costly to industry as compared to weaker standards that do not allow such flexibility. There is a strong case for transparency and stability of regulations over time on the ground that unclear and frequently changing regulations create uncertainty and increase compliance costs, as companies avoid environmental investments with high up-front costs even if they reduce abatement costs in the long run. Accordingly, countries that implement efficient environmental policies and allow sufficient flexibility to their industries to respond creatively are more likely to enjoy positive environment—competitiveness linkages than countries that implement rigid command and control regime or frequently changing regulations. Unfortunately, India has gone in for a command and control regime on the U.S. pattern. However, at the enterprise level it is the quality of management which would be the key factor. Faced with a given set of environmental regulations, better managed companies are more likely to identify and exploit input—saving opportunities than are the poorly managed competitors.

Environmental programmes and projects currently being undertaken by the developed economies like Japan and Germany account for about 2-3 per cent of GDP, whereas in India, it is less than 0.5 per cent. If India has to reach the level of environmental standards achieved by other countries, where there has been a steady decline in the level of pollutants in the ambient air and water bodies, our efforts will have to be multiplied manifold. On the other hand, stepping up inputs for environment conservation by resource scarce economies like India, would be rather difficult. Efforts, therefore, will have to be directed to increase the resource use efficiencies by cutting down on wastage, for which ample scope exists in India, any where in the range of 10-50 per cent.

A four pronged strategy to achieve this potential during the coming decade is:

1. Awareness generation among the masses and training of personnel who can identify potential areas of resource conservation.
2. Large scale adoption of cleaner technologies by adopting a credible and consistent stick and carrot policy.
3. Dissemination of technologies and experiences for successful adoption or adaptation.
4. Devising a more progressive environment policy that enables enterprises to respond in a more imaginative manner.

Information Technology

There is a significant relationship between the level of information technology in a country and the amount of inward foreign direct investment. At the same time, there is also a link between growth in production and improvement in technology. Adopting more sophisticated information technology promotes growth. Accordingly, there is a significant co-relation between increase in the number of telephone lines and increase in gross domestic product per capita and rate of growth of internet hosts and subsequent economic growth. In short, Information Technology matters in development. According to Alan Greenspan, Chairman, U.S Federal Reserve Board, it is the extensive integration of IT in industry that is behind the highly favourable trend of productivity increase in the U.S economy in recent years.

The basic information tools which seem to matter most are international telephones, computing power and the fax machine. Because of the complementary nature of the two technologies, there is an extraordinarily close link between PCs and telephone lines per capita. In a ranking of world nations by Information Technology, India's position is fairly at the bottom followed only by Poland and China despite the success of

its software capital, Bangalore and the emerging cyber city, Hyderabad.

For the efficient utilisation of its high potential, information technology needs high quality human capital, universities and research institutions and stable power supplies which in turn are linked to enrolment in tertiary schools, quality of scientific and research institutions and sufficient power generation capacity. The government has an important role to play in creating the necessary conditions for allowing the new technology to bloom but the governments often err by not protecting intellectual property or by over-acting and maintaining costly national monopolies in information technology especially in the state sector which leads to low quality of technology provision. The Government needs to resist the temptations to overtax this sector simply for the sake of raising revenues.

Despite that the resource endowment of the country typically favoured large scale application of IT in India, the country has turned out to be a laggard so far. Waking up a little late, there is now an all around awareness of the need for catching up with the rest of the world in the case of this crucial infrastructure. The recent recommendations of the high level task force constituted by the Prime Minister had attempted to fill the void in this regard. However, as in many other cases, the implementation of the task force's recommendations is proceeding at a snail's pace. While the recent fiscal measures announced by the government had rendered the level playing field even so far as India is concerned, the main hitch remains in that the communication infrastructure continues to be dominated by the state which in no way has proved to be a leader in productivity, efficiency, innovation or customer responsiveness. As such the trend has been towards privatisation, wherever it was in the state sector. The swift transition to IT based technology regime may warrant, therefore, freeing this infrastructure from the insensitive state monopolies.

What Needs To be Done?

It is obvious that if India has to markedly improve its competitive position. The areas where it is weak have to be strengthened. This is necessary not only to attract foreign direct investment in order to raise the level of investments but also to improve the efficiency and all round development. The following major areas require immediate attention.

1. The immediate problem that needs to be solved is in respect of infrastructure. In both the GCR and WCY, India is at the bottom of the list in almost all the areas of infrastructure. More of the public investments in infrastructure have to be deployed mainly in power, roads, ports, communications and Information Technology. Private sector participation in these sectors should be accelerated by removing the road blocks that still remain.

2. For attracting private investments in power sector, the State Electricity Boards (Ss) have to be restructured through corporatizing them. Distribution of power is to be de-linked from production and transmission. Similarly, transmission from the production units to the distribution centres has to be separated and handled by different agencies. For this purpose, electricity tariffs also have to be modified. All consumers have to pay the minimum cost of electricity. Subsidies on power to agriculture and domestic users should be removed in a phased manner. In the intervening period, modalities need to be worked out to cross subsidize from the internal revenue generation. Those state governments desirous of supplying power to particular groups at concessional rates will have to bear the cost as part of the budget. All the consumer connections will have to be necessarily metered. Under no circumstances power suppliers will be forced to bear the costs due to concessional supplies to any group.

3. In the field of telecommunications, the requirement is more for infusing greater participation by the private sector. Whether it is basic telephone services or information technology like internet, large scale private sector participation is to be encouraged. The tendency to maximise revenue generation by the Government monopolies by raising the tariffs may become counterproductive from the point of view competitiveness and there is a need to bring down the long distance and ISD rates, which are among the highest in the world.

4. In all the areas of infrastructure, the regulatory authorities have to be made independent of the Government. Otherwise, it would cast doubt about the impartiality.

5. Infrastructure projects unlike industrial projects, typically generate revenue in domestic currency and are linked to domestic inflation. As a result, these projects can not rely too heavily on external debt without exposing themselves excessively to foreign exchange risks (recent East Asian crisis is an example). The availability of long-term domestic debt is therefore a critical constraint on the pace of private investment in

infrastructure. Unfortunately, for India, the domestic debt market is as yet at an early stage of development in India as in many developing countries. An important institutional requirement for a healthy domestic debt market is the existence of long term contractual savings. Sources such as the insurance companies and pension funds have a natural appetite for long term high quality debt. Reforms in the insurance sector are therefore crucial for increasing private financing in infrastructure. Government has recently announced 26 per cent equity participation by the foreign companies in the insurance sector. This proportion may be increased to at least 40 per cent.

6. Not only our R&D expenditures as a percentage of GDP is small as compared to the developed countries, the private sector funding of R&D in the country is also negligible. Private Sector funding of R&D in countries like Korea account for more than 80 per cent, while it is about one third in the case of Brazil. In India, majority of R&D activities is taking place in Government or Government aided institutions (public funding of R&D in India is about 88 per cent of the total R&D expenditures). Indian organisations need to develop their brand equity through innovation and R&D. Recent studies in America show that innovation contributes about 50 per cent of the growth in output in the country. The Government can facilitate the R&D activities by providing tax rebate on equipment and intermediate products used for R&D purposes. It is the organisation which needs to be innovative and also participate with the public institutions in R&D activities including setting up their own state-of-the-art R&D centers. In the ultimate analysis, competitiveness is what the corporate leaders can deliver to the nation.

7. Lack of venture capital has been identified long ago as a major weakness in India's financial market. Intensified efforts are required to launch an agency which can effectively fill the void, with capital participation by all the financial institutions and the banking industry. Simultaneously, rules/regulations regarding venture financing need to be rationalized and simplified.

8. All subsidies whether central or state like on food or fertilizers are to be eliminated in a phased manner and in a period of say, 3 to 5 years. This will serve mainly two objectives. Firstly, it would help in reducing the fiscal deficit thereby reduce the pressure on prices. This will also make export more competitive and devaluation of the rupee may not become necessary in order to keep the Real Effective Exchange Rate at reasonable levels. Secondly, by reducing or eliminating subsidies, more financial resources will be available to build infrastructure including the social infrastructure in the public sector.

9. The reduction in fiscal deficit is to be achieved through reduction in public expenditures by government by cutting down unproductive expenditures on administration through restructuring/re-engineering government administration and also through privatization/dis-investment in public sector undertakings of both the Central and State governments. Earnest efforts should be initiated to down size the government, both State and Central. While there should be continuous public sector dis-investments, efforts are also to be made towards closing the sick and non-viable units. The management of the core public sector which is required to be retained under the direct control for strategic reasons would need to be given real autonomy in order to be effective.

10. Improving FDI inflows, increasing the role of the private sector, and enhanced disinvestments, etc. will also depend, to a considerable extent, on the labour market reforms. Labour market has to be more flexible. The role of the state has to be more of a facilitator in order to ensure balance between the rights of both labour and management. To attract FDI/private investments in industries particularly infrastructure, the following could be resorted to:

    - A clear enunciation of the rights and responsibilities of employers and workers/ unions;
    - Unambiguous and easily understandable legal and institutional framework;
    - Predictable arrangements concerning union recognition, collective bargaining, skills development, flexibility and workforce adjustment;
    - Well defined, clear-cut and time bound procedures for grievance redressal;
    - Administrative and judicial system that can be trusted for its transparency, expediency, efficiency and accountability.
    - Perhaps, a task force for rationalizing labour laws on the lines of one of IT could be constituted.

11. Skill obsolescence has been and will continue to be a constant feature of industrial dynamism. Developed countries cope with the phenomenon through a continuous process of de-skilling, retraining and redeployment. For example in Singapore, the norm followed by the companies rated as excellent is 40 hours of training per worker every year involving an expenditure of 4 per cent of the pay roll. This does not seem to be happening in India. It has to be accepted that the responsibility of training, retraining and continuous upgradation of skills rests with the employers.

12. Achieving rising levels of productivity and more sophisticated strategies require improving local access to suppliers of raw materials, components, machinery, services and information. It is in this context that the large (lead) units should strengthen the capabilities of small and supporting industries financially and technically. The suppliers should be encouraged regularly to take part in the joint engineering and analysis of new components/parts before a new product is launched. The large units should assign engineers and technicians to teach/train the small suppliers with regards to use of new equipment, modern management techniques and organising work more efficiently.

13. The policy of product reservation in small scale sector seems to have outlived its purpose. This policy is not in tune with the techno-economic developments taking place through out the world including in India. In order to encourage healthy competition to deliver value to customers, the policy of product reservation may be progressively eliminated over a period of 5 years.

14. Though India's stock market has been in existence for a long time, compared to many developing and upcoming countries, it lacks sophistication in terms of modernization (e.g., electronic trading). There are significant delays, lack of transparency, an element of uncertainty and high costs associated with the transfer of shares due to the outdated mode of transactions. Similar is the case with other financial markets. Majority of the branches of various banks are not computerized and even in big cities, the branches of major commercial banks are not inter-linked. Therefore, it is of utmost priority to modernize the financial markets for easier and faster transaction of business. The major cause of the East Asian crisis was due to the underdeveloped financial markets.

15. The intensity of local competition in the context of micro foundations is highly significant in explaining the growth in GDP per capita as has been explained earlier. It is in this context that a country needs to have its own anti-trust (competition) policy. India does not have the laws that have been especially designed in order to promote competition. The closest that comes is the MRTP Act 1969, amended in 1991. However, services provided by the Government or public sector or government undertakings are outside their control. Government's recent move to set up a Committee to recommend modern competitive (anti-trust) laws for promoting competition, is a welcome step in this direction.

16. Corruption especially at higher levels seriously jeopardizes a country's economic progress by patronizing inefficiency, vertically and horizontally. It cuts at the very root of the fundamental social values which the nation seeks to achieve since independence. It negates the ideal of a liberal merit based society founded on the basic tenet of equality of opportunity. This evil needs to be eradicated completely, if India has to establish its distinction among the comity of nations; the earlier the better.

17. Prevalence of a high degree of illiteracy to the extent of nearly half of the population for more than 50 years after Independence is a drag on the speedy growth of the economy and is a blot on the image of a modern and powerful India that we seek to establish. Primary education not only needs to be recognized as a fundamental right, all our energies should be devoted to achieve universal elementary education. Innovative initiatives like those taken recently by the Government of Madhya Pradesh need all round support. Such efforts may be strengthened in the country in such a manner that illiteracy is totally eradicated with in a short span, not later than a decade in any case. Other priorities are improvement, both qualitative and quantitative, in secondary, vocational and technical education, by forging closer links with the trends in the job markets.

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Most low technology consumer products have achieved very high penetration rates in developed countries while their penetration in developing countries is still very low. This offers multinational corporations a large potential market.

(c) A reduction in tariffs has further facilitated the import of goods from other countries exerting competitive pressures on domestic companies. In addition, access to foreign funds at lower rates has helped capacity additions in several sectors leading to increased competition. Moreover, the ability to import requirements is limited by the availability of foreign exchange reserves. Currently, India's foreign exchange reserves cover only nine months of imports and any reduction in the foreign exchange reserves could trigger the depreciation of the rupee offering indirect protection to the domestic industry.

Consequently, Indian manufacturers are now exposed to competition on account of an increase in the linkages of the domestic industry with international demand and supply economics. The issue of competitiveness of the domestic industry gains importance mainly on account of the strengthening of these linkages. However, the extent of these linkages is dependent on policies followed by the government in various sectors.

The impact of changing government policy on broad sectors of the economy has been as follows:

Consumer goods – This sector is still highly regulated with most items being placed in the restricted imports list and others requiring Special Import Licences (SIL). Therefore, domestic players in the consumer goods sectors are relatively protected.

Infrastructure – On the other hand, in the infrastructure sectors, the government has formulated different policies for domestic and foreign players. Consequently, competitiveness of domestic players would be difficult to ascertain.

Commodities – This sector has however been significantly liberalised primarily on account of WTO requirements. This has resulted in increased competition in these sectors comprising industries like steel, petrochemicals and fibres. Further, the impact of liberalization has been significant on manufacturers of commodities, mainly on account of low product differentiation and therefore limited pricing flexibility.

The present paper has therefore focussed the analysis on the commodity sectors and four commodities namely aluminium, steel, petrochemicals and fibres have been used as case studies.

Competitiveness in the backdrop of competition

This is relevant only against the backdrop of competition. A scenario of decreasing competition or increasing protection does not exert competitive pressures on domestic industry mainly on account of the cushioning effect of protection. However, increasing competition exerts pressure on prices and availability of goods and hence on corporate bottom lines. It is in this scenario that competitiveness gains significance. Hence, before analysing the competitiveness of any industry it is important to determine whether the competition in the industry has increased over the same period.

The Porters model has been applied in the context of the following broad policy changes that have taken place in Indian industry post reforms.

(i) Licensing of capacities has been removed in almost all sectors. This allowed manufacturers in several key sectors to expand capacities and set up large plants. Scale economies resulting from such expansions led to improvements in cost efficiencies.

(ii) Import duties on capital goods has been brought down to levels of 20-25 per cent. This reduced costs of new projects is in line with those prevalent in developed countries.

(iii) Prices of many essential raw materials like Natural gas and Naphtha have been linked to international prices resulting in domestic players being able to obtain the same at competitive rates relative to their international counterparts.

(iv) Several sectors (like cement and coal) in which government had complete control on distribution and pricing were partially or completely decontrolled.

(v) Restrictions on foreign participation in joint ventures (for e.g. in commercial vehicles) were relaxed leading to greater transfer of technological know-how.

While these changes reduced protection and improved linkages between the domestic and international industry, reduced import duties also led to a reduction in

costs of key raw materials and project imports. Changes in the degree of competition against the backdrop of these broad policy changes are analysed in the present paper.

Competitiveness is relevant only against the backdrop of competition. A scenario of decreasing competition or increasing protection does not exert competitive pressures on domestic industry mainly on account of the cushioning effect of protection.

The Porter Model

The (Fig.1) model focuses on four main factors- *Buyer Power, Supplier Power, Entry Barriers* and *Threat of Substitutes* as determinants of the extent of competition in a particular sector or industry.

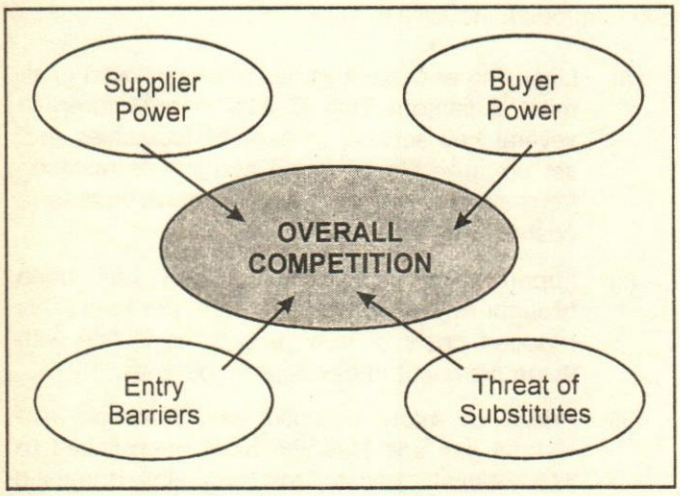

Fig. 1. Buyer power

Competition in an industry increases/decreases with increase/decrease in buyer power. Buyer power is high in industries where monopsony (large number of sellers and limited number of buyers) exists. Typically, buyer power is high in industries where government is the sole buyer of goods like for e.g. in industries related to defense machinery.

Post 1991, increasing level of private participation in Industry (mainly due to de-licensing of capacities in most manufacturing sectors) has led to a wider base of customers. This has led to a decline in buyer power for manufacturers in sectors like steel. While a decline in buyer power has reduced competition, increasing availability of substitutes and greater quality requirements of customers has offset this reduction. Therefore, buyer power has remained more or less un-affected due to the liberalization process.

Supplier Power

Competition in an industry increases/decreases with decrease/increase in supplier power. Supplier power exists in its extreme form in industries with monopolies (large number of buyers and few sellers) which enables manufacturers to charge a premium on goods. Such monopolies exist in case of government controlled industries like railways etc.

The government controls most of the natural resources in the country namely coal, natural gas, power etc. This has led to considerable supplier power in the past with domestic manufacturers having no control on these costs. Though the scenario, in terms of ownership has not changed significantly, entry of private producers of power and installation of captive power plants has led to a reduction in supplier power.

Further, a significant reduction in supplier power has been mainly due to the removal of licensing restrictions on capacities. The impact of this has been mainly on the second level intermediates. Further, relaxation of FDI and equity participation norms has led to the availability of greater funds for the setting up of economic size plants as in the case of petrochemicals.

Threat of Substitutes

Competition in an industry increases/decreases with greater/lesser availability of substitutes. Greater availability of substitutes enables customers to switch between products offering similar benefits, thus increasing the customer's bargaining power. The threat of substitutes has been mostly limited to the metals and plastics industries. Increasingly, plastics are replacing metals in almost all applications, particularly in the consumer durables, automobiles and packaging sectors. Plastics like Acronitryile Butadiene Styrene (ABS) and High Impact Polystyrene (HIPS) have replaced conventional metals like Steel and Aluminium in refrigerators, air-conditioners, washing machines etc. Further, higher level plastics like Styrene Acronitryile (SAN) have started replacing lower level plastics in consumer products like refrigerators and toothbrushes.

Therefore, on an average, the threat from substitutes has increased. This has mainly been on account of reduction in tariff barriers on plastics and the setting up of large-scale capacities, both of which have led to a

reduction in average unit costs. This has increased competition for the metal sectors.

Entry Barriers

Competition in an industry increases/decreases with decrease/increase in entry barriers. Entry barriers impose restrictions on the number of players in the industry. Entry barrier exist mainly in industries with high capital requirements for establishing capacities or brands.

Pre-reform entry barriers were mainly on account of licensing of capacities, high import duties on capital goods, restrictions on FDI and equity participation and restriction on external borrowings. Removal of capacity restrictions has led to large-scale capacity additions as witnessed in the petrochemicals sector. Further, availability of international funds at low cost coupled with a reduction in import duties on capital goods has led to a reduction in the average capital cost per unit. This has enabled petrochemical majors to set up economic size plants at lower costs.

In some sectors like steel (mainly mini steel plants), technological changes have increased entry barriers on account of high capital costs as well as costs associated with importing key raw materials required for the new processes. Thus, 'A reduction in supplier power coupled with reduced entry barriers and increased threat from substitutes has led to increased competition for manufacturers in key industries in the Indian economy'.

Factors affecting competitiveness

The factors determining competitiveness can be classified under four broad categories – Costs, Market size, Nature of buyer, government policy and additional load (for e.g. infrastructure bottlenecks).

Costs – Overall manufacturing costs of a firm can be divided into variable and fixed costs. While Variable costs include costs of raw materials and conversion costs, fixed costs include debt servicing charges and costs associated with setting up of capacities. In India, even labour costs can be considered as fixed costs mainly on account of rigid labour laws.

Raw material costs are impacted by changes in import tariffs in cases where a significant proportion of the inputs is imported. These costs are also impacted by government policies on important raw materials in the mining sector for example coal. On the other hand, conversion costs determine efficiencies of the firm in converting inputs to finished goods. These costs are impacted by changes in power costs and economies of scale (dependent on the size of the domestic market). Fixed costs are impacted by changes in import duties on capital goods and government policies on external borrowings and FDI.

Table 1: Porters' Model: Change in the degree of competition in key Indian industries post 1991

Sector	Buyer Power	Supplier Power	Threat of Substitutes	Entry Barriers	Competition
Petrochemicals	⇔	⇓	⇔	⇓	⇑
Steel	⇓	⇔	⇑	⇑	⇑
Aluminium	⇓	⇔	⇑	⇔	⇑
Synthetic Fibres	⇑	⇓	⇔	⇓	⇑

Market Size – The market size is dependent on demand growth, capacity growth and share of imports. Due to a reduction in tariffs in almost all sectors post liberalization, share of imports has assumed greater significance.

An increase in market share of domestic manufacturers in a growing market indicates availability of size to benefit from economies of scale and ability to withstand competition from imports.

Nature of buyer – Increasing sophistication of the end user leads to expectations of better products and state-of-the-art technology. This tendency of customers to upgrade in terms of expectations increases the pressure on companies to improve both in terms of technology and fulfilling market needs.

Government Policy – Government influences firm and sector competitiveness through policies on effective level of protection available to industry, indirect tax levels and policies with respect to resource allocation. Protection to the domestic industry is available through tariff and non-tariff barriers and a depreciating local currency. Post liberalization, the government has reduced tariffs in most sectors. However, rupee depreciation during the same period led to indirect protection to the industry.

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Inefficiencies in capital allocation are also caused through government policy on labour, bankruptcy and

foreclosure. Prevention of efficient re-allocation of resources through policy reduces return on capital employed and increases overall costs of the economy, thus affecting industry competitiveness.

Additional load – This is created through distortions in costs due to inadequate infrastructure facilities. Infrastructure facilities include storage facilities available at ports and rolling stock available with the railways.

Measurement of competitiveness

Having identified the factors impacting competitiveness, we identify measurable parameters, which can be used to indicate changes in each of factors.

Table 2: Parameters of competitiveness

Factors	Parameters used for measurement
Share of market	CAGR growth in Consumption
	Capacity growth
	Share of imports
Overall costs	
Raw material	Raw material costs per unit
Conversion	Conversion costs per unit
Capital	Interest rates on debt
	Premiums on equity
	Import duties on capital goods
Government policy	Effective import duty calculated as Exchange rate* (1 + Import duty)
Additional load	Port infrastructure
	Storage facilities
Returns	Rupee profits
	Profit margins

Table 2 shows parameters, which have been identified as measures of each of the above mentioned factors.

Measurement of competitiveness for key industries

Using the above factors, we have tried to measure change in competitiveness in the above mentioned industries. The change in competitiveness has been measured over the period of reform to ascertain the effect of economic reform on each of these industries.

Measurement of changes in competitiveness during the reform period (post 1991) in key commodity sectors is outlined below.

Aluminium

Share of domestic market

Domestic consumption of Aluminium has grown at a rate of 6.5 per cent CAGR (Cumulative annual growth rate) during the period 1992-98. This demand growth was met through a 4.7 per cent CAGR capacity growth and improved capacity utilisations. However, share of domestic manufacturers declined from 99.4 per cent in 1992-93 to 95 per cent in 1997-98 mainly on account of import of specific grades of aluminium subsequent to the reduction in import tariffs.

Overall costs

The domestic Industry has been able to achieve CAGR growth of 5.5 per cent during the period 1992-98. At the same time, the industry has been able to reduce overall manufacturing costs. The decline in overall costs was mainly on account of a decline in conversion costs through increased utilisation of captive power. Raw material and capital costs remained stable during the period.

Government regulation

The industry achieved a 5.5 per cent growth in sales and a decline in overall manufacturing costs in a scenario of decreased protection. The average effective protection for aluminium manufacturers declined during the reform period, despite the depreciation of the rupee, mainly on account of a reduction in import duty on ingots. Import duties on ingots declined from 60 per cent to 25 per cent during the period.

Additional Load

Further, additional load in the form of freight bottlenecks increased mainly on slow growth of rolling stock (wagons) of railways which grew at a lower rate than Aluminium consumption growth.

Returns

Despite a decline in protection and increase in systemic load, Aluminium manufacturers have been able to reduce conversion costs and achieve sales growth. This led to an improvement in profitability and increased profits for domestic Aluminium manufacturers during the period 1992-98. Thus reform process has enhanced competitiveness.

Petrochemicals

Share of domestic market

Domestic demand for petrochemicals has grown at a rate of 17 per cent CAGR during the period 1992-98 which was met through a 19 per cent CAGR capacity

growth. At the same time, share of domestic manufacturers increased from 55 per cent in 1992-93 to 85 per cent in 1997-98 mainly on account of a reduction in imports of petrochemicals.

Overall costs

The domestic Industry has been able to achieve CAGR growth of 40 per cent during the period 1992-98. At the same time, the industry has been able to control manufacturing costs. While raw material and capital costs declined during the period, they were offset by higher conversion costs. The decline in raw material costs was mainly on account of benchmarking of naphtha prices to international prices while capital costs declined on account of access to international funds at lower costs.

Government regulation

The domestic manufacturers were able to increase their market share by around 30 per cent despite constant protection levels. The decrease in import tariffs was more or less offset by the depreciation of the rupee.

Additional Load

Further, additional load in the form of in-adequate port infrastructure reduced significantly. This added to the cost efficiency of the domestic industry through a decline in the costs of distortion.

Returns

The domestic manufacturers of petrochemicals were able to achieve 40 per cent CAGR despite stable protection levels. At the same time, they were also able to control overall manufacturing costs. This led to an improvement in profits for the Indian petrochemicals industry during the period 1992-98.

Therefore, the reform process appears to have enhanced competitiveness of the Indian petrochemical industry.

Synthetic fibres

Share of Market

Domestic demand for synthetic fibres has grown at a rate of 17 per cent CAGR during the period 1992-98 and was met through a 18 per cent CAGR capacity growth. However, consumption share of domestic manufacturers has grown at a lower rate of 16 per cent mainly on account of an increase in share of imports.

Overall costs

At the same time, domestic manufacturers of synthetic fibre were able to reduce their overall costs mainly through a reduction in their raw material, conversion and capital costs. Installation of large capacities for production of fibre intermediates led to a reduction in raw material costs while capital costs declined due to improved access to international funds at lower costs.

Government policy

During the same period, effective protection for the industry declined on account of a reduction in import duties.

Returns

Post liberalization, the industry has witnessed lower protection, high growth and capacity build up. However, despite lower protection, the share of imports has declined during the period after liberalization. Overall costs of manufacturing also reduced due to improved cost efficiencies. However, despite volume growth and improved cost efficiencies, the industry' margins and profits declined significantly on account of decreasing realizations.

The inability to protect margins in a scenario of reduced protection is reflective of deterioration in competitiveness. Therefore, the reform process appears to have decreased competitiveness of the Indian synthetic fibre industry.

Steel

Steel manufacturers can be classified into Integrated steel plants (ISP's) who are large manufacturers with backward linkages upto the mining of ore and mini steel plants (MSP's). While ISP's use the blast furnace technology for manufacture of steel, MSP's use the technologically advanced electric are furnace for manufacture of steel. The electric arc furnace requires higher capital cost per unit and consumes large amount of power. Further, MSP's need to import scrap of set up sponge iron plants, which adds to their cost of manufacturing.

Share of Market

Domestic demand for steel grew at a CAGR of 8.7 per cent during the period 1992-98. The growth in demand for steel was accompanied by a 5.1 per cent CAGR growth in capacities. These capacities were mainly due to high cost MSPs. However, the share of

domestic manufacturers declined marginally from 93.4 per cent to 92.5 per cent despite an absolute growth in market size.

Overall costs

Overall costs for ISPs remained stable during the reform period. A decline in conversion costs was offset by an equivalent increase in capital costs caused due to capacity expansions funded through high cost domestic debt. On the other hand, MSPs have gained from a net decline in the landed costs of scrap but have been impacted by an increase in conversion costs owing to the rise in power costs. Further, capital costs for almost all MSP's increased mainly on account of capacity expansions funded by high cost domestic debt. Despite government permission to access international debt and equity markets, most steel manufacturers were limited by size and lack of established track record.

Therefore, market growth for ISPs was accompanied by control on overall manufacturing costs. However, MSP's witnessed an overall increase in costs.

Government Policy

Domestic steel manufacturers have been able to maintain their market share in a scenario of declining effective protection. Effective protection for both ISP's and MSP's declined mainly on account of a reduction in import duties.

Additional Load

Further, rolling stock (wagons) of the railways did not grow at a rate commensurate with the growth in steel consumption leading to additional load in terms of freight costs.

Returns

Domestic ISP's were able to record market growth accompanied with a control on overall costs despite declining effective protection and increasing systemic load. This has resulted in stable margins and profits. *Therefore, competitiveness of ISP's appears to have remained stable during the reform period.*

However, in the case of MSPs, a decline in effective protection and addition of high cost capacities led to a drop in net margins during the reform period. Therefore, *competitiveness of MSP's appears to have declined due to the reform process.*

Conclusions

Competitiveness of an industry is affected by changes in market share, overall manufacturing costs, government policy and additional load (which create distortion in overall cost structures). These changes can be measured by the use of parameters like market share, variable and fixed costs, effective protection available to the industry and changes in infrastructure facilities.

However, competitiveness gains importance only in an environment of increasing competition. Using the Porter's model, we have concluded that competition in key industries like Aluminium, Steel, Synthetic fibres and petrochemicals has increased during the reform process. Further, measurement of competitiveness in these industries over the reform period, has revealed that while competitiveness of firms in the Aluminium, Petrochemicals and Steel (ISP's) has increased post reforms, competitiveness of firms in the synthetic fibre and Steel (MSP's) industry has declined over the reform period.

Domestic share of consumption in a scenario of decreasing effective protection has been identified as an important factor in ascertaining changes in competitiveness. However, an increase in market share through a decline in margins and absolute profits is a sign of weakness. Industries like Aluminium and Petrochemicals which have been able to increase their share in the domestic market while protecting their profitability in a scenario of decreasing effective protection have improved their competitiveness through the reform period. □

Financial Sector Reforms – Imperative for Competitiveness

Robert Gibson

The paper emphasises the key role of financial sector to constitute for enhancement of competitiveness of Indian industry. Institutionalised reforms in the financial sector have been outlined in this connection. In particular funds must be delivered in an efficient and low cost manner, thereby facilitating growth and investment. The paper in this context points out several systemic hurdles and suggests means to overcome them as far as feasible.

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Paper presented at the NPC-FICCI-SCOPE-NCAER conference on National Competitiveness Policy, New Delhi; 5-6 April 1999.

Introduction

It is well realised that there are still some hurdles for ensuring better rates of growth and prosperity in India, and lower inflation and interest rates. In the financial sphere, there are two very detailed reports published towards the end of 1998: the report on 'Reforms in the Financial Sector and Capital Markets', commissioned by the Prime Minister's Advisory Council on Trade and Industry, and 'Report of the Task Force on Capital Markets Constituted by FICCI', co-chaired by Ashok Desai and Deepak Parekh. Regretfully the candour of Mukesh Ambani, in presenting the first report to an audience in Mumbai, was kicked off by stating that his report contained nothing new or unknown. And indeed, many if not most of his recommendations have been echoed in the FICCI report. Ofcourse, Financial sector reforms, among other reforms, are imperative for competitiveness – In this context certain priorities and observations based on our experiences here and abroad can be spelled out.

Competition for Capital

Most importantly, capital is required to fund growth, and there is a constant competition for such capital. An economy lacking efficient means of mobilising and distributing that capital will be penalised in at least three critical ways: it will not gain access to the necessary capital, it will pay too much for it, and it will not use it optimally. All three are currently true of India.

Domestically, the need to increase the savings rate has been recognised, but putting those savings to work effectively is just as great a challenger: too much money is sucked out in financing central and state deficits, with the result that capital formation especially in the crucial area of infrastructure has suffered badly in recent years; too much money, subsidies and funding unprofitable PSUs; high interest rates have hampered industry and deterred investors

from considering anything other than risk-averse investments; this has been exacerbated by inefficiencies and worse in capital markets.

Fiscal Deficits

The theoretical importance of the fiscal deficit as a policy target is well understood. Too great a deficit has a number of adverse effects. High levels of government borrowing crowds out private investment, thereby skewing the allocation of resources; and if this increased government borrowing is used for relatively non-productive purposes, such as covering a shortfall in the current account, it will result in displacing capital formation in the economy, thus leading to a lower rate of growth. It will also tend to lead to higher interest rates due to the size of demand for borrowings, which in turn will affect growth rates. Both the reports mentioned in the beginning stressed the importance of improved macroeconomic management. Recent comments by the Finance Minister on elimination of revenue deficits, shrinking of fiscal deficits, reducing the size of government, introducing or increasing user charges, introducing a central VAT all indicate recognition of the ills and some of the potential cures, but making a serious impression on government finances is a long-term project, and one is hampered by political and social realities. Whatever, it is very necessary.

Disinvestment of PSUs is possibly slightly outside the immediate subject of financial sector reforms, but because of the drag the loss-makers exert on government finances, as well as the invigorating effects privatisation has had elsewhere in the world on capital markets, there is relationship. A study on privatisation in emerging markets co-authored by Flemings and the World Bank summarised the themes that have driven privatisation around the world as follows:

1. Getting government out of business – by strengthening market forces to promote competition, which will increase productivity and efficiency, lowering the cost and raising the quality of goods and services.
2. Generating new resources of cash flow and financing for enterprises – by eliminating government crowding out of equity markets, encouraging the return of flight capital, promoting FDI, facilitating domestic savings and investment, and broadening and deepening domestic equity markets.
3. Reducing the government's fiscal deficit – by using privatisation revenues to retire external and domestic debt, reducing fiscal transfers to state enterprises, and increasing tax revenues through higher profits generated by privatised enterprises.

These themes are relevant to India today. However, it is more than seven years since the Government Statement on Industrial Policy which first pointed them. Of course some major disinvestments, notably in the telecomms sector, have been carried out but so far little in the way of privatisation.

Again, the question of overhauling the PSU sector is an immense one, and highly political. India has an advisory commission on disinvestment, but it has yet to develop the machinery in place to convert decisions into actions as expeditiously as possible. Since 1992, PSU disinvestment proceeds have only twice exceeded their budget target, and in the most recent year the methods employed were not optimal. Specifically, some form of central body seems to be missing – this could perhaps be responsible for the broader question of restructuring the PSU sector, rather than just disinvestment. Many other countries have set up such bodies. At the moment, a great many different ministries are involved in the process, and without some form of central body enjoying specialist knowledge which transcends the normal ambit of the ministries, learning curves will be longer, wheels will be reinvented, processes will take longer and mistakes will be made.

Financial Sector Reforms

The essence of reforms in the financial sector and the financial markets is to connect the saver/investor with the real sector of the economy in an efficient way – that has not been happening in recent years. Providing or facilitating appropriate channels, with as few inefficiencies as possible, will allow funds to flow smoothly to where they can be useful; they will reduce transaction costs and lead to structurally lower and more stable interest rates, and thereby lower costs of capital for the users of capital.

Progress in Equity Markets

The equity culture in capital markets of India is over a hundred years old, and thus it does not need to be invented, as in some countries where it either did not exist or was buried for several decades. And whilst there has been an estrangement between the investor and the capital markets in recent years, many major improvements have been made: the institution of SEBI in 1992,of the NSE in 1994, of screen-based trading in the major stock exchanges, the inauguration of the NSDL in 1996,

and the rolling out of compulsory dematerialisation through 1998 and 1999. Use of technology has played a major role in many of these improvements, and this must be a lesson in other areas – India has a natural advantage in the technology area which, it seems,is being exported widely but perhaps not being applied enough at home.

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The onset of full dematerialisation, and recent very good volumes on the exchanges and flows to mutual funds all suggest that India has potentially a solid platform for equity markets going forward.However, there's plenty that still needs to be done. A handful of examples will suffice. Corporate governance needs to be improved further, i.e., strong, independent directors should be empowered to represent interest of shareholders. Accounting standards must be improved, to give better information on segmentation of businesses, especially it would be desirable to see consolidation of accounts. More stringent regulation is needed companies quoted on the stock markets or making issues – how, for example, one could prevent companies changing their names to give a software slant, if their business mix does not justify it? With the onset of dematerialisation, it is seen that access to Depository Participants for investors in outlying areas is being held back by lack of connectivity; this is an issue critical also to connecting depositories, once more than one is in operation. Similarly, electronic transfer of funds needs to be introduced – remarkably, for the first time, stocks can now be transferred in India more quickly and efficiently than cash! Not only would electronic funds transfer facilitate the introduction of rolling settlements, another desirable development in stock markets, it would also beneficially impact financial and commercial aspects of all businesses in India.

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Debt Markets

In India they are already quite large, but not very actively traded. Again, a wider, deeper and more active debt market has a vital role to play in delivering funds at appropriate cost to potential users. Development of benchmark rates, by reference to government borrowings, and the establishment of a credible yield curve, resulting from improved infrastructure and access for more market players, would result in much more efficient (and overall lower) pricing of debt.

It is in this context that reforms in the insurance sector are important. In most developed markets and many developing markets, a competitive insurance sector ensures active investment of funds in a range of equity and debt instruments. The present structure of government monopoly in the insurance sector, and the investment and insurance requirements imposed by government, stand in the way of efficient pricing of insurance, and of competitive investment products being developed. One could make similar comments about the very tight restrictions on pension and provident funds – again, reforms in this area could have a beneficial effect on flow and cost of funds.

Funds preemption

Government must ensure preemption of funds. In addition to the examples just mentioned, the Statutory Liquidity Ratio imposed on the banks represents another preemption which, when combined with the high Cash Reserve Ratio, inefficiencies due to overstaffing and low use of technology, and problems of NPAs, inevitably mean that cost of funds to private borrowers get pushed up. Of course, the government will still need funding. Thus, if one were to make the reforms implied in my foregoing comments, this reemphasises the need for measures to create deep, viable debt markets, open to a broader range of well capitalised players, willing and able to buy government paper.

There are also a host of enabling actions which could facilitate the development of better debt markets. Removal of stamp duty on creation of mortgages would help securitisation, a technique currently underutilised in India; the ability to enter into interest rate swaps would help market players to balance their portfolios and risks; legal reforms would allow lenders more certainty in taking on risks.

Role of venture capital

Venture capital, or private equity, forms an important part of the financial framework in many other countries, yet it is not well developed in India. Measures to develop a venture capital industry, in particular to fund young, entrepreneurial businesses, especially

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those based on new technologies, would be desirable. One of the reasons that the private investor burned his fingers in the equity markets in the mid-90s has been many inappropriate schemes and companies came to the market. In effect, the private investor was being asked to act as a venture capitalist, which requires sophisticated understanding of risk.

Curbing regulators

So far, the various avenues for investment were treated as different entities. Actually, it's probably quite important that they are brought together, particularly at points of distribution, to enable investors to make informed choices about the appropriate asset classes for their chosen risk/reward profile. A point made by one of the capital market reports is that the plethora of regulators overseeing different elements of the financial markets stands in the way.

Role of FDI

Externally, India is in competition with other countries for capital. It is known that, whilst FDI into India has picked up through the 1990s, it remains low compared to the sums attracted by other countries – notably China and Brazil – and the actual inflows to approvals ratio remains very poor. This problem is likely to be made more acute over the next year or so, as Flemings believes that private capital flows to emerging markets will more or less halve in real terms. Most countries – with one or two notable exceptions such as Malaysia – have tended to liberalise further in order to compete for scarce capital.

FDI has a significant role to play if India is to achieve a superior (perhaps double-digit) rate growth, and one that will make a meaningful difference to its people's prosperity. Overall, to achieve such a growth rate, Jardine Fleming has stated that a level of investment around 30-40 per cent of GDP is needed, well above current levels which are nearer 25 per cent. With an existing savings ratio around 25 per cent this leaves a further 10-15 per cent of GDP in funding requirements. It is also worth commenting that attracting and freeing up capital is only one side of the coin. The capacity of the economy to absorb such large amounts of capital has to be improved by magnitudes. Improving the absorptive capacity requires significant changes to policy at a micro level including the creation of appropriate institutions at the state level as well as removing impediments to investment in key areas such as power, telecom and other areas of high absorptive capacity.

FDI has a significant role to play if India is to achieve a superior (perhaps double-digit) rate growth, and one that will make a meaningful difference to its people's prosperity.

Conclusions

The present paper appears to digress on a couple of occasions, but there is a theme that runs through the comments made. That is, that the financial sector's contribution to enhancing India's competitiveness should be attracting and delivering funds in an efficient and therefore low-cost manner, thereby facilitating growth and investment. To the extent that systemic hurdles stand in the way, further reforms in the financial sector must be made.

□

Creating Superior Customer Value for World-wide Competitiveness

Hans H. Hinterhuber, Kurl Matzler & Gernot Handlbauer

This paper addresses the issue of developing and implementing strategies for firms in a hypercompetitive and turbulent environment has been addressed in the present paper. Referring to a military metaphor, hypercompetition in a turbulent environment is compared to a "positional war" with detrimental effects for all competitors. Incremental change does not help to break out of a positional war and transform it into a "mobile war". For this able leadership is needed whose taste is to discover new opportunities and changing the rules of the game.

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If we can really understand the problem the answer will come out of it, because the answer is not separate from the problem.

– Jiddu Krishnamurti

The major responsibility of leaders in turbulent times is to motivate and inspire employees and managers as well as to find and implement new ways to generate value for customers and other key stakeholder of the firm, such as employees, stockholders, suppliers, partners in strategic networks and society in general. The turbulent and competitive conditions today justify a careful evaluation of the rules of the game, and the search for new management approaches.

Management in Turbulent Times

The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.

– Bernard Shaw

The question of how to increase international competitiveness has become vital and indispensable to all enterprises. Raising the competitive level depends on old and new competitors' abilities to develop and implement strategies that shorten innovation and cycle time, improve the quality of offered services and reduce costs. Leading competitors are attacked by innovative firms from all over the world, established "rules of the game" are constantly violated or evaded in order to break up existing markets and to bend market equilibria in one's favour.

Raising the competitive level depends on old and new competitors' abilities to develop and implement strategies that shorten innovation and cycle time, improve the quality of offered services and reduce costs.

Lester Thurow (1997) distinguishes five system-forming trends, which, like tectonic plates, float on imaginary seas of magma. they drift apart and float towards each other, overlap, collide and thereby transform the foundations of the world economy. The five tectonic plates are:

1. The "end of communism" with all its consequences:

(i) the flood of previously inefficient resources used, such as mineral oil and natural gas, aluminium, nickel and titanium ores and more

(ii) the oversupply of qualified, yet underpaid Russian scientists

(iii) a shift of investments into developing countries with lower wages and

(iv) the flooding of Western countries with agricultural products.

2. Knowledge and education as a comparative advantage of regions:

(i) the first production sites were chosen due to their proximity to raw materials, later due to the availability of capital and labour, today the level of education is decisive

(ii) though in a globalised world everything can be produced everywhere

(iii) the premium on American and European wages is overcome and being reduced and

(iv) the wage level of unskilled labour in industrial nations will decrease to that of developing countries.

3. The population dynamics:

(i) the Earth's population will increase by 50 per cent over the next 30 years, from the present 5.7 billion to 8.5 billion

(ii) population growth exceeds economic growth

(iii) the pressure of migration from the South to the North will increase

(iv) "overaging" and pension liabilities ruin the welfare state, destroy national budgets and prevent the desperately needed investments in the social and economic future

(v) an immense transfer of resources to the unproductive part of the population lies ahead

(vi) the share of citizens over 65 will double in the coming 30 years

(vii) as voters, these citizens will not hesitate to ruin the welfare system and

(viii) all industrial nations cumulated already have five times greater social security contributions for the "unproductive" over 65 than for those between 14 and 65.

4. the problems of globalisation:

(i) the big trade blocks – e.g. Nafta, Mercorsur and Apec – will not last due to a lack of vision

(ii) the much too rigid job protection in the EU will lead to massive migration of firms to countries with more lenient taxation and social legislation

(iii) the production plants of Mercedes Benz and BMW were located in Alabama and South Carolina because both these states had the lowest density of regulations, the lowest social security contributions and very flexible labour laws and

(iv) the dwindling tax revenues will force budget cuts and will also let expenditures for education, infrastructure and pension schemes shrink.

5. the distribution of power in the world:

(i) since the collapse of communism, the European problems and perspectives are not congruent with those of the USA anymore

(ii) the USA will return to the isolationism of the 1930s

(iii) Europe is not mature enough yet and will be occupied with its integration for the next 50 years

(iv) Japan will not become eligible for a leading role due to the rest of the world's lack of interest and its lack of military capacity

(iv) the future will be coined by multipolarity without a dominant power and a political centre and

(vi) no society can be built on the foundation of a capitalism which has lost all ethical values and whose goal is solely the pursuit of personal needs.

The most important force in world-wide competition is the increasing awareness of the East Asians that their moment in history has come and that they will finally belong to the group of developed societies (Mahbubani, 1995, p. 105). Continuing awareness that East Asia can produce anything equally well if not better than other cultures has generated confidence, that

is further strengthened by the recognition that the time until they catch up with the developed world is coming ever closer.

International Competitiveness

The present economic system is going in an unpredictable direction. The only assurances are that there are no assurances and that the complexity and speed of change are increasing. In this situation all enterprises have to be prepared to make use of emerging opportunities and to avert incalculable risks. Strategies have to be aimed at creating values for all stakeholders. Figure 1 illustrates the evolutionary process of international competitiveness of an enterprise based on the further development of core its competences. The efficient development, effective exploitation and committed preservation of core competences distinguish a successful enterprise from an ordinary one.

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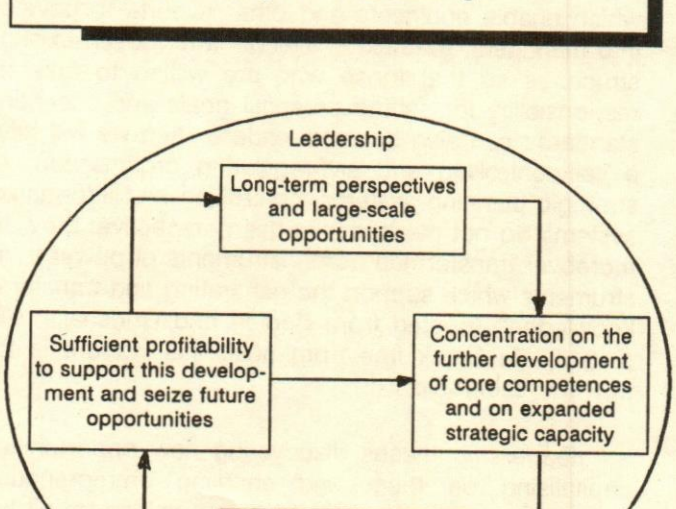

Fig. 1. The evolutionary process of international competitiveness of an enterprise (modified from DeWoot, 1994)

In order to take advantage of this evolutionary process of international competitiveness an enterprise needs to (1) understand and recognise the critical role of leadership, (2) be able to concentrate and develop core competences that create superior customer value and (3) benefit from the advantages of co-evolution.

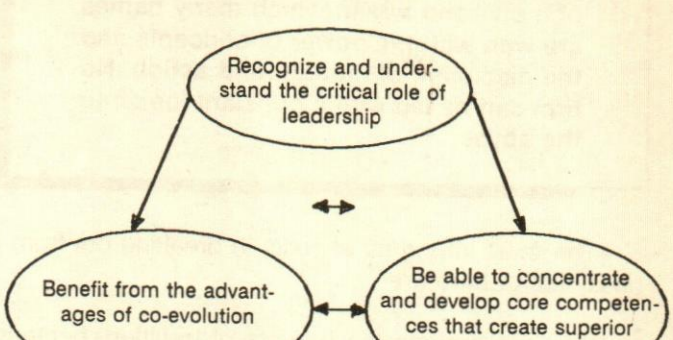

Fig. 2. Three critical tasks in order to exploit the evolutionary process of international competitiveness

Arenas of Competition

A leader is a dealer in hope.

– Napolean Bonaparte

Competition takes place in three arenas and take the form of positional, mobile or imitational warfare (Fig. 3).

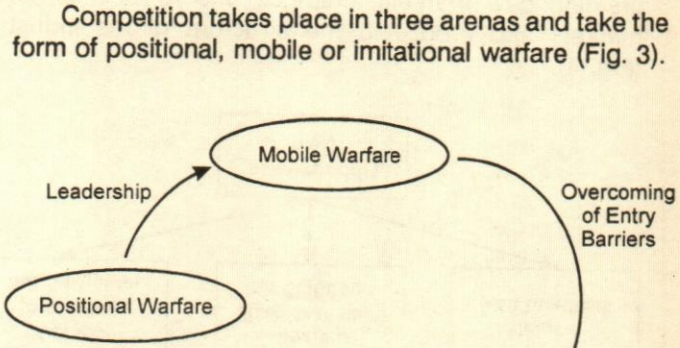

Fig. 3. The arenas of competition (Valdani, 1997)

The use of a military metaphor is the result of increasing attention to the behaviour of competitors and the development of competitive strategies. Competition can be compared to a form of a civilised war in which many battles are won with the power of concepts and the discipline of thought and action. No firm can be led with a constant look into the abyss. Positional warfare devolves into mobile warfare if (1) an established firm changes the competitive rules through an innovative concept or a new competitor enters the market with an innovative product or process, or (2) an enterprise creates a new market by introducing an innovation or breaks free from the deadly competition with a revolutionary entrepreneurial idea.

Competition can be compared to a form of a civilised war in which many battles are won with the power of concepts and the discipline of thought and action. No firm can be led with a constant look into the abyss.

The most important aspects in breaking out from a positional warfare are:

(1) to overcome the barriers of tradition, heritage, history, culture and habits within an enterprise

(2) to create scope for creativity and imagination and to transcend past experience

(3) to build "competence corridors" which offer more options than are presently available.

This can be done by effective leadership which implies discovering new opportunities and capitalising on them. New opportunities can be identified by creating new markets, changing the rules in existing markets and modifying the structure of the industry (Fig. 4).

Fig. 4. Leadership means discovering new opportunities and capitalising on them

Innovation creates new markets, changes the competitive rules in existing ones and in the firms' environment or breaks up existing market structures. This leads to mobile warfare which improves profit expectations to the extent that a firm differentiates itself from the competition and creates superior value for customers. Sooner or later mobile warfare evolves into imitational warfare; the lower the barriers of entry or the easier these can be evaded, the more intense this imitational warfare will be. Imitational warfare will lead back to positional warfare. This again generates an advantage for customers, but lowers the attractiveness of the industry. In hypercompetition a firm must dispose of resources and competences in order to pursue all three types of war simultaneously: positional, mobile and imitational warfare.

Role of Leadership

As far as the future is concerned what is important, is not to predict it, but to make it possible.

– Antoine de Saint-Exupéry

There are three types of executives in every company: the administrator, the change manager and the leader (Hinterhuber and Krauthammer, 1997, p. 6).

- Administrator-managers only manage and do not adapt to changing situations. They are mentally dead.
- Change-managers try to attain agreed-upon goals with creativity and innovation. Firms need change-managers it they want to survive positional warfare.
- A leader has a vision and discovers new opportunities, invents the future and agrees attractive goals with change-managers. He is a role model and creates value for customers, employees, shareholders and other stakeholders of the firm.

G. Lindahl, executive vice-president of ABB, says in this context: "My first task is to supply the structures which enable engineers and other experts to develop into managers; the next challenge is to loosen existing structures so that those who are willing to take on responsibility for setting personal goals and accepting standards can also become leaders, then we will have a self-controlling and self-regulating organisation. All strategic planning systems, controlling and information systems do not disappear in this perspective, they are moreover transformed from instruments of power to instruments which support the generating and transfer of knowledge" (quoted from Bartlett and Ghoshal, 1995, p. 815). To break free from positional warfare is the task for leadership.

Leadership means discovering new opportunities, capitalising on them and enabling entrepreneurial change processes in order to create values for all key stakeholders. *Management* means creative problem solving.

Management can be learned more easily than leadership; in turbulent times, however, leadership is more important than management when radical changes have to be implemented or creative and sustainable performance improvements are required. The enterprise needs both leadership and management to discover and exploit new opportunities in turbulent times.

Management can be learned more easily than leadership; in turbulent times, however, leadership is more important than management when radical changes have to be implemented or creative and sustainable performance improvements are required.

Core Competences

Delighting customers is the name of the game in which we are all engaged.

—Thomas Berry

Prahalad and Hamel (1990) define core competences as systematically clustered combinations of individual technologies and production skills underlying the variety of product lines of a company. Honda's core competence concerning engines and driving strands serves as an example. Stalk *et al*, (1992) provide a broader definition of core competence. Their definition includes the entire value chain. Honda's management of traders and production development serves as an example. The attempt to synthesise both definitions engender the following definition: core competences are integrated totalities of technologies, know-how and processes. They are co-ordinated through organisational learning processes that:

- customers perceive as valuable
- are unique compared with those of competitors
- add value to all key stakeholders
- are difficult to imitate, and
- provide potential access to many markets.

SWATCH's core competence lies in the creation of "emotional goods". It is a combination of automation technologies, design and marketing. Swarovski's core competences comprise abrasive technology, design, marketing and the creation of events. Core competencies are those integrated activities and functions where the enterprise is "best in world, not best in region or town" (Quinn, 1992).

Core competences are the concentrated abilities, technologies and processes that keep moving the "value-adding-mechanism" of a company. They are responsible for the strategic business units of a company being the leading competitors of their market segments. The very origin of competitive advantages is the ability to translate technologies, know-how and production skills into core competences on the level of the whole company. Core competencies are not tangible or visible elements of the surface structure of a company. Rather, they are part of the deep structure of the organisation.

Core competences are the concentrated abilitles, technologies and processes that keep moving the "value-adding-mechanism" of a company. They are responsible for the strategic business units of a company being the leading competitors of their market segments.

Summarising, core competences are:

(1) Specific abilities within individual functional areas, for example, marketing, production, research and development, etc. Montedison, an Italian group of chemical companies, has lived on the inventions of one employee for many years. It was the Novel prize winner Giulio Natta.

(2) Specific abilities that cover several functional areas, for example automation, information technology, logistics, etc.

(3) Overlapping business processes aimed at satisfying customers as well as other stakeholders. Benetoon's core competences on the process level provide an example. Benetton masters cutting, colouring, marketing and sales information in a way that revolutionised the market for leisure, sports and children's clothing.

Customer Value through Core Competencies

So far customer satisfaction was mostly seen as a one-dimensional construction—the higher the perceived product quality, the higher the customer's satisfaction and vice versa. But fulfilling the individual product requirements to a great extent does not necessarily imply a high level of customer satisfaction.

In his model, Kano (Kano, 1984) distinguishes between three types of product requirements which influence customer satisfaction in different ways:

Must-be requirements: If these basic requirements are not fulfilled, the customer will be extremely dissatisfied. On the other hand, as the customer takes these requirements for granted, their fulfilment will not in-

crease his satisfaction. Fulfilling the must-be requirements will only lead to a state of "not dissatisfied" customers. The customer regards the must-be requirements as prerequisites, he takes them for granted and therefore does not explicitly demand them. Must-be requirements are in any case a decisive competitive factor, and if they are not fulfilled, the customer will not be interested in the product at all.

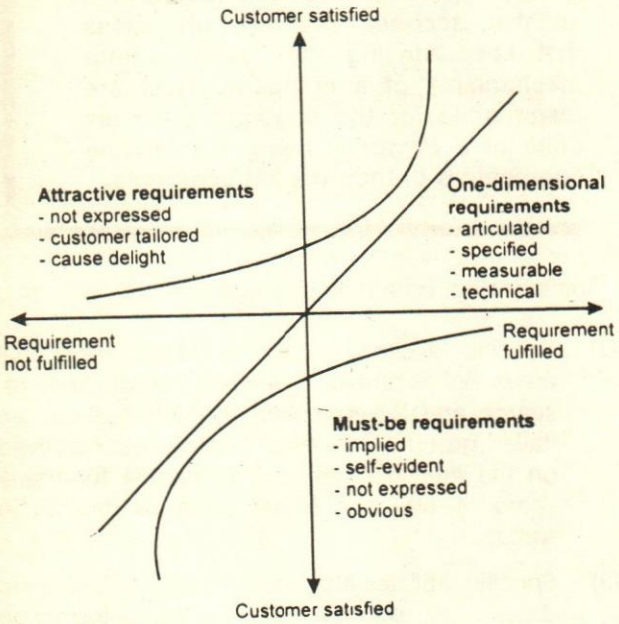

Fig. 5. Kano's model of customer satisfaction (see Matzler *et al*, 1996)

One-dimensional requirements: With regard to these requirements, customer satisfaction is proportional to the level of fulfilment – the higher the level of fulfilment, the higher the customer's satisfaction and vice versa. One-dimensional requirements are usually explicitly demanded by the customer.

The advantages of classifying customer requirements by means of the Kano method are:

- Product requirements are better understood: The product criteria which have the greatest influence on the customer's satisfaction can be identified. Classifying product requirements into must-be, one-dimensional and attractive dimensions can be used to focus on.
- Priorities for product development. It is, for example, not very useful to invest in improving must-be requirements which are already at a satisfactory level but better to improve one-dimensional or attractive requirements as they have a greater influence on perceived product quality and consequently on the customer's level of satisfaction.
- Kano's method provides valuable help in trade-off situations in the product development stage. If two product requirements cannot be met simultaneously due to technical or financial reasons, the criterion can be identified which has the greatest influence on customer satisfaction.
- Must-be, one-dimensional and attractive requirements differ, as a rule, in the utility expectations of different customer segments. From this starting point, customer-tailored solutions for special problems can be elaborated which guarantee an optimal level of satisfaction in the different customer segments.
- Discovering and fulfilling attractive requirements creates a wide range of possibilities for differentiation. A product which merely satisfies the must-be and one-dimensional requirements is perceived as average and therefore interchangeable.
- Kano's model of customer satisfaction can be optimally combined with quality function deployment. A prerequisite is identifying customer needs, their hierarchy and priorities. Kano's model is used to establish the importance of individual product features for the customer's satisfaction and thus it creates the optimal prerequisite for process-oriented product development activities.

In order to deliver high customer value the following strategic implications emerge from Kano's model: all must-be requirements must be fulfilled, a company needs to be competitive with regard to one-dimensional requirements and stand out from the rest as regards attractive requirements!

The Customer Value – Competence Portfolio

Applied mediocrity goes much further than unapplied excellence.
– Balthasar Gracian

The Portfolio method is a comprehensive and manageable instrument of analysis. It combines the

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results of individual analyses, reduces the information flow to its essentials and renders the results visible. Within the portfolio one can position the competences in relation to their ability to create customer value. Depending on the position one can come to different conclusions and implications for the management of core competences.

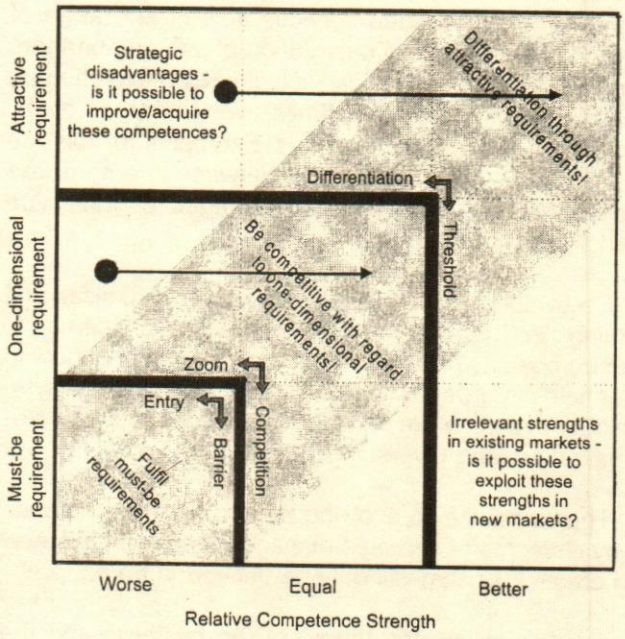

Fig. 6. The customer value–core competence portfolio (Hinterhuber *et al*, 1997)

Customer Value is defined by the ability of a company to fulfil must-be requirements, be competitive with regard to one-dimensional requirements and the ability to differentiation through attractive requirements. Relative competence strength results from a comparison of the company's core competences with the competitor's competences.

Must-be requirements: These constitute market entry barriers. If they are not fulfilled a company is not able to compete in this market. These competences are just necessary in order to keep normal business going. Therefore, a company needs to master these competences either by developing them or by acquiring them through co-operation or co-evolution. If however, a company outperforms its competitors with regard to these competences it does not necessarily generate a competitive advantage. Here, it has to be examined whether these competences meet attractive requirements in other markets and therefore are able to create superior customer value. A continuous examination of the transferability of these competences to other markets/products is necessary.

One-dimensional requirements: They fall into the "zone of competition". A company needs to be at least as good as its competitors in fulfilling these requirements. If the competence strength is poorer compared with that of its competitors the company has a significant competitive disadvantage, if it is better it is a source of competitive advantage. Here, a company needs to develop or maintain these competence at least the same level as its competitors. These competences generate competitive advantage only in the short run for two reasons: (1) customer expectations develop over time–what today can be considered attractive requirements, will be one-dimensional requirements which will become must-be requirements in the long run and (2) as these requirements are explicitly articulated by the customer and all other competitors compete on these competences a company's lead time will be short. Competitors will try to imitate these competences as soon as possible.

Attractive requirements: These are the basic for differentiation and for the creation of superior customer value, provided that must-be requirements are fulfilled and the company is competitive with regard to one-dimensional requirements. Real core competences that determine the corporate profile exist only in the following cases:

- if the competence strength of a company is high in relation to that of its competitors
- if the competences can be attributed a high present and future customer value

The strategic idea to focus on core competences is indispensably connected to the concentration of one's own strengths against competitors' weaknesses (Snyder and Ebeling, 1992). There are more or less comprehensive patterns of how to develop, concentrate, co-ordinate and exploit competences within the enterprise. Competences can be transferred to other markets, missing competences can be developed. One way to do this is co-evolution. This strategy will be discussed below.

From Evolution to Co-evolution

Everything should be made as simple as possible, but not simpler.
–Albert Einstein

Evolution is the enterprise's adaptation to the needs and expectations of the stakeholders. Not all customers, employees, suppliers, shareholders, social interest groups or partner firms are necessarily stakeholders. Stakeholders are interest groups which suffer a disadvantage if the firm were to disappear from the market.

Customers are only considered stakeholders if they depend on a company supplying important solutions for their problems and do not dispose of alternatives in such a case. Employees are not stakeholders unless they have dedicated time and energy to the development of company-specific know-how which has no or little material value outside the original company. Stakeholders are only those employees who represent knowledge relevant to the firm's core competencies and are integrated into the firm's internal and external relational network. A similar argument applies to other stakeholders. Only those shareholders who have connected their fate with that of the company and only those suppliers for whom the company is the major customer are actually stakeholders (Hinterhuber *et al*, 1998).

"There are things that even God cannot do", said Nasreddin once upon a time to one of his pupils who feared to offend someone. "What is that?" asked a student. "He cannot satisfy everyone", answered Nasreddin. Every firm has to set priorities in the satisfaction of their stakeholders (Matzler and Hinterhuber, 1998).

Co-evolution is the adaptation to the needs and expectations of the stakeholders of the new or meta-system arising from the combination of different firms' core competencies. Co-evolution is a mutual evolutionary change in interacting systems or, in other words, a reciprocal adaptation to respective needs and expectations. Together with their new environment, these companies from a co-evolving meta-system, that "learns its way into the future" (Stacy, 1996, p. 335). But also each single firm is subject to learning processes as a response to impulses and feedback from the meta-system, resulting in behavioural changes.

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In the new system, new qualities appear, frequently unplanned, which in turn cannot be explained by the members' characteristics and the relationships between them; the new system is therefore an "emerging system" (Stahl, 1996, p. 360).

In a *symbiotic partnership* contributions and burdens do not have to be spread evenly. Even if one partner, as in nature, claims advantages at the expense of the other, the result is still better than if each had remained on its own. The Italian producer of optical glasses LUXOTTICA entered a symbiotic partnership with the American shoe producer US Shoes (Valdani, 1997). All partners benefit through focussing their respective core competencies on customer satisfaction by providing unexpected services at a broad range of different points of sale. Co-evolution of differing partners from different industries can initiate a co-evolutionary cycle if new partners, sometimes even long-time rivals, join in such win-win partnerships. Examples for this are development co-operations between automobile manufacturers in pre-competitive stages of the value chain (Hinterhuber and Levin, 1994).

Co-evolution is versatile and varied organisational learning. SWATCH learns from Siemens and vice versa. Both companies can implement the gained know-how in other fields in order to increase value. Partners in a symbiotic co-evolution are simultaneously teachers and students, takers and givers.

The future of a co-evolving system is not predictable; many elements of strategic management within this new and creative system will only be defined in future:

- The vision, the theory of the business and the values of management develop gradually and spontaneously from the "emerging order".
- The strategy will continuously be adapted according to the actions of invading competitors and the evolving expectations of consumers.
- The leaders will have to grow with the new tasks or have to be replaced they fail to adapt.

In contrast to the game of chess, political elections, sports or poker, this co-evolution is not a zero-sum game. Everybody wins in a symbiotic co-evolution, though not necessarily to an equal degree. Co-evolutionary relationships are based on mutual information and trust. Information and trust link the partners in reciprocal increase of value (Matzler and Hinterhuber, 1998).

Conclusions

Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning stays young. The greatest thing in life is to keep your mind young.

– Henry Ford

As life in general, the economy is ambivalent;

problems and opportunities have many dimensions. Co-evolution is an indirect strategy, but in strategic management a detour is often the fastest way to the goal. When determining industrial sectors and companies as candidates for co-evolution, it is most important to overcome the boundaries of tradition, culture and habits leaders have grown accustomed to. Companies which hold on to the past will fall prey to their lack of insight. Life cannot step back, it cannot repeat itself. Every distance we have walked, we have left behind us forever. The proactive attitude of leaders toward co-evolution, their join perspective of the future, their belief that innovative concepts drive the increase of a firm's value rather than the expansion of market share at a rival's expense, the intuition for market changes, mutual trust, frankness, these and other qualities determine the success of a symbiotic partnership.

Such a partnership requires resources and instruments which encourage the development of new know-how and which are based on information, communication, creativity, trust and speed as well as on a link between various core competencies. Neither in war nor in business battles are wars only through mobility (Hamel and Prahalad, 1996, p. 237).

The main results are:

1. In difficult times leadership is more important than management.

2. Grasp the overall picture. Strategic thinking is usually limited to one industrial sector and one market segment. The more the barriers between sectors and segments blur, the more urgent becomes a broader perspective including successful strategic positioning and benchmarking from other industries in order to identify candidates for co-evolution by combination of core competencies. The goal is to outline evolutionary scenarios that comprise value raising options for all participants.

3. The *strategy* as all long-term perspective originates from a vision of co-evolution and not from the partners' strategic intentions. If this vision of co-evolution is to be more than wishful thinking, it has to be developed realistically, scientifically and analytically, and it has to be known by all partners.

4. Freedom to act within the boundaries of common objectives for all partner firms imposes *management by directives*; directives are guidelines needed to attain the common goals (Hinterhuber, 1997, p. 5).

5. *Co-evolutionary learning* focuses on the comprehension of relationships and interactions between different firms and increases the value of bundled core competencies. Co-evolution initiates new learning processes for all partner firms.

6. *High involvement.* Companies contribute their core competencies to a symbiotic co-evolution, they adapt to the particularities of the common market and furthermore try to make use of productive capacity in multiple socio-cultural contexts for common projects as well as for their own core business.

The new paradigm of co-evolution is still "work-in-progress". Nevertheless, it underlines that complementary forms of organisational development should be thought of as ways to dramatic performance improvement for the company as well as for the partner firm. Complementary forms of organisational development are based on interactions, trust, and operative links between the different firms' core competencies from various industries. Co-evolution is a process in which interdependent companies are integrated in mutual evolution. The meaning of co- evolution reaches beyond competition and co-operation; co-evolution is the path out of positional warfare; it is a detour as it avoids the direct comparison between competing products and services and creates new opportunities by linking various core competencies.

The statement of Nasreddin, probably the wisest of all men, also applies to co-evolution: "Always and with everything you do, try to combine the useful for others with the pleasant for yourself".

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Infrastructure & Competition

Yoginder K. Alagh

Debating on the issues of infrastructure and competition, the author illustrates the efficiency of government policy measures and in particular takes the case of power sector, with specific reference to existing power production scenario in the state of Rajasthan. The questions of better and competitive designing of power units have been addressed and detailed out in the paper.

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Introduction

Infrastructure sectors have a number of interesting special characteristics. Capital costs and cost of initial investments are generally high. Once the initial investments have been made, the unit level operating costs of producing output are low. In the recent phase technological change has been rapid. Ricardo Pettrella, the chief of the European Commission's Fast Directorate called this the propensity of newer inventions to build on the corpses of earlier techniques. Another feature of recent technical change has been the ability to decentralise technological improvements at the user end. This has introduced the possibility of considerable flexibility at the level of the management of the distribution end of infrastructure products and services. If the societal infrastructure is available, these are the days of retail markets in electricity working through real time and interactive communication systems, working not only in the developed, but also developing countries. This introduces a certain degree of complexity in policy formulation for such sectors which simple paradigms tend to miss. Two such paradigms which have caused substantial damage in India have been the notion that all infrastructure should be planned centrally and that any deviation is a sell out, or at the other extreme, the view that private competition without regulation will do the job and so if you stop investing in the public sector and sit back, all will be well. In the first half of the nineties India became the center of great debates on the ideology of economic overhead investment and the periphery of the creation of capacity in electricity, roads and communication and very soon the extraordinary good performance of these sectors in the eighties became a memory.

When discussing competition in infrastructure industries two problematiques lend themselves for analysis. The first is competition in the short run. This becomes the question of rules for improvements in capacity utilisation and cost reduction, which in many cases are two sides of the same coin. For example in a continuous process like electricity generation, un-

planned shutdowns lead to high costs start up costs are high. Rules and organisations which lead to improvements in management systems for delivery efficiencies at the user end also become a part of this analysis. The second problem is the question of a market for capacity creation. Here again the question is the set of organisations and rules which create incentives for capacity creation and modernisation at the cheapest possible prices in terms of unit deliveries of output. There are related questions of avoidance of exclusion and externalities which become important if environmental concerns are objectives and are also policy concerns. For example a lot of public interest case law in North America, both U.S. and Canada, has been on protecting the rights of small consumers in retail power markets (avoiding exclusion) and on pollution issues. It may be noted that to an economist, policies for incentives include disincentives to discourage perverse behaviour, namely, raising costs or discouraging benign technical change.

To begin with a brief presentation is made of recent performance in both the analyses of short run markets which are those of the output performance of infrastructure industries and the markets of capacity creation and improvements. But the main focus is on legal systems, economic and financial rules and organisation which encourage reform or what the organisers of these meetings have called "competition" mainly one may concentrate on electricity, because it is believed that a market has been created in this sector of a rudimentary kind and so a real discussion is possible. Some of the principles discussed will have relevance elsewhere. Finally discuss the paradigm question has been discussed it is believed that a strategic policy framework using market and other instruments is required in this sector.

Competitiveness in the Short Run

There are unfortunately very few rule based incentives for producers, transmitters and distributors of electricity in India, to assure increased supply at competitively determined efficiency costs and with reasonable quality. The system of cost plus pricing is built into the electricity act and works out at a rate of return on the cost of electricity to serve. Y.K. Alagh, Jayashri Saha and V.K. Shah had shown in detailed study of the Gujarat Electricity Board that if unplanned shutdowns at the unit level could be reduced substantially savings would emerge. If the GEB could implement the systems approach to maintenance of tubes, the cost of production of electricity would go down on account of three reasons – reduction in energy input per unit of out put, overhead costs distributed over larger volumes of production and larger revenue sales from the same capacity. Alagh, *et al*, estimated this savings at 40 paise per unit if GEB could achieve the maintenance norms set by the NTPC.

The tariff setting principles after the liberalisation policy in 1991 also ignored this aspect. In the initial phase the Government announced "counter guarantees" for specific projects, which has an amazingly anti efficiency principle of incentive setting and will always act as a bottleneck towards genuine reform in the power sector as we will see later. When tariff principles were finally enunciated for the Independent Power Producers, they were all cost based – separately for thermal and hydel producers. As is well known cost plus pricing systems have built in pressures for escalation and worse do not give incentives for technical improvements. Alagh, *et al*, had worked out that beginning with a saving of around 10 paise in the unit cost to serve of power, the savings could go up to 52 paise per unit, in the Gujarat case study.

At a more general level, in his Lov Raj Kumar Lecture on Fuel for Power, Alagh has estimated that the average cost of generation varied form 19 p/kwh to 115 p/kwh for hydel stations and 79 p/kwh to 288 p/kwh for thermal stations. The average costs went up as follows for hydro and thermal stations.

P/kwh			
Item	92-93	96-97	% increase
Fuel	33	47	42
Power Purchase	36	57	58
Establishment	20	24	20
Total	129	187	45

The Planning Commission estimates for normative costs for Indian coal vs. imported naphtha were as follows (to give an idea of cheaper and expensive options);

P/kwh					
Fuel Type/ Location	Delhi	Gandhar	Vizag	Cuddalore	Ib Valley
Indian Coal	199	209	177	213	158
Imported Naphtha	246	219	219	223	229

Now it is quite obvious that normative costs of new plants can compare favourably with the actual cost of electricity to serve, even when their capital charges are much higher. The issue of efficiency pricing has, therefore, serious implications for the economy.

There are two implications to discuss. First in very

limited fields efficiency pricing is being tried in spite of considerable opposition from power producers who want to stick to guaranteed returns. This is particularly so in the transmission and distribution sectors. Second if pricing and incentive systems fostering efficiency are not there, as a transition strategy, other systems of a command type have to be developed.

Pricing Incentives

There are very marginal incentives for competition and efficiency in the short run working of electricity systems in India. One such system developed in response to the need to transmit power across grids in India. In 96-97, electricity growth in India, was only 3.7 per cent. This growth was minus 8 per cent in April 97 and 2.85 in May 97. With special efforts it went up from 7 to 8 per cent from June to October 97. In November 97, demand in the Northern, Eastern and Western region started slackening. In spite of full reservoirs a number of states backed down hydel generation. Energy deficits, as high as 12 to 14 per cent, went down to 6 to 8 per cent. Large generating units like Rihand, Badarpur, Kahalgaon, Talcher, thermal units of PVC and in the state sector, plants like Bhatinda, Ropar, Kota Kolaghat and Titagrah had to back down. But the Southern Grid was still having large deficits. The United Front Government decided to approve a National Grid and a Power Trading Corporation. But this would take Time. In the short run it was decided to explore all possible methods of transmitting more power to the south. First the Power Grids. In Chandrapur, Ramagundam HVDC line was targetted for completion. Then back to back arrangements were worked out by the CEA. Interestingly once the technical feasibilities were worked out, the economics became a bottleneck. The Eastern Region SEBs as also the Central parastatals with excess capacity, wanted full cost reimbursements. Now if your PLF is low, overhead costs per unit would be high. Some units wanted Rs. 6/kwh of electricity. Inefficient rules never make sense. Here were units willing to shut down but would not supply at marginal cost, the first rule for profit making.

Since an economist was Minister, we forced through an "availability" tariff, inspite of publicly stated objections including by Central parastatals. This tariff works on opportunity cost efficiency principles and so power from unutilized capacities would be rationally priced. In January 1998, 2 million units of electricity went from the Eastern coal belt to Kerala. Then on Valentines Day 98, the author was woken upon my birthday with the frightening news that 1000 MWs of capacity was on forced outage in the Southern Grid, including the flagship Ramangundam. The author's two year stint as a Union Minister ended with a blemish, but by now the systems were working and while you were all sleeping over 600 MW power was shipped of the South. Truly power went from Kashmir to Kanya Kumari. It has continued since.

Interesting short run reform ideas have been developed by Rajasthan, or the reform package discussed by the Government of Gujarat with the Asian Development Bank. The policy makers in the country and the Power Finance Corporation encourages this approach of alternative methods of reforms.

The approach of macro reform has also however to be simultaneously followed up with the specifics of reform around lending packages for new projects or subsystems of the power economy. This is the concept of "islanding". It goes on the precept that while progress is being made towards the macro reform of the entire system, organisational, technical and economic reform has also to be seen through at the level of projects or subsystems of the sector. At that time in 1998, there was no energy shortage in Rajasthan. In fact, the Kota Thermal Power Station had backed down and the frequencies of power supply at all the 132 KV Distribution and Transmission systems. There were no circuit breakers and even the fuses were in some cases of an unacceptable kind. The operators were generally untrained. It is interesting that the Government of Rajasthan had introduced a new scheme called "Tatkal" connection or the "immediate" connection at the farm level in which they had declared a rural electricity tariff rate of Rs. 1.25 which is close to the target rate recommended in the Electricity Regulatory authority legislation introduced by the author in Parliament. It was interesting to note that during this financial year of the registered connections 1203 had still to be given in the district of Chittor, 409 in Udaipur and 212 in Ajmer. In all these districts, more than 15000 farmers each wanted to take advantage of this scheme but were not registered since the distribution capacities did not exist. The Rajasthan Government has "Islanded" reform for investment in the rural transmission and distribution system for this project. The farmer has demonstrated in a concrete manner that he is willing

The approach of macro reform has also however to be simultaneously followed up with the specifics of reform around lending packages for new projects or subsystems of the power economy.

and capable to pay for reliable energy supplies. The Power Finance Corporation and the Rural Electrification Corporation have been requested to provide the State assistance for investment in the distribution network. It will be viable. It may be noted that major international companies have pre-qualified for the bidding procedure initiated by Rajasthan for privatization of its rural distribution system.

Similar examples can be constructed for reform packages around channelising borrowings to specific rehabilitation and modernization projects, transmission projects and generation projects. If at the project level organisational mechanisms can be created for a search for efficient technology and investment packages, implementation machineries and economic reform so that the repayment of the principal and debt servicing is clearly identified by a banker, this kind of policy reform should go hand in hand with the reform of the State Electricity Boards is a whole. In fact, it can be reasonably argued that to wait for the reform process of the entire Electricity Board to be completed before project level lending and investment can begin seems to be an approach which would delay the process of the rejuvenation of the Indian Electricity Sector.

Some of the reforms which have already been initiated and are more questions of detail rather than the bigger issues of macro reforms which generally get media attention need to be noted. Some of these are very important for an orderly process of investment in the Electricity Sector. It has been argued by some commentators that the approval of the capital expenditure to be incurred in power projects by the Central Electricity Authority as required under the Indian Electricity Act is inconsistent with a tariff based international competitive bidding procedure. Since capital costs and fixed aspect of a two-part tariff are obviously two parts of the same coin, thus argument is almost tautological. Detailed scrutiny of private sector investments in projects is not necessary anyway. However, any regulatory authority may need through the lifetime of a project an estimate of capital expenditure. This may be required, for example if in the lifetime of the project alternative distribution and transmission systems also develop, like for example, an availability tariff which as one sees now is being actively implemented in some of the India's regional grids or the alternatives power purchase mechanisms at the level of inter- regional distribution systems by newer kinds of commercial machineries which may provide the trading counterpart of availability tariffs. At this stage, it is possible that the system is operated by an independent regulator, than capital expenditure incurred by a power project may also be required to be taken into account by that regulator, if the IPP would like to enter these newer arrangements rather than taking advantage only of a cost plus tariff. Thus, for these and other reasons, it should be possible for us to work out the information requirements of the present regulators in a manner such that the investment process is not substantially delayed.

The Finance Ministry has assured in 1997 the power sector that it will work out the arrangements through which the Indian financial institutions will be in a position to fund the borrowing requirements of viable power projects on a continuous basis.

There are also interesting proposals from different parts of the country where associations of power users are willing to get together to provide for decentralized systems of distribution of energy and assure payment for the same. Associations of producers needing dedicated power capacity or groups, like artisans or in some cases cooperatives which have experience in some other sectors and would like to enter power distribution, are examples.

Transitional non-Price Arrangements

Growth of energy production in 95-96 was only 3.7 per cent. In April, 97, it was minus 8 per cent and 2.8 per cent in May, with energy deficits crossing 12 per cent and peaking deficits 18 per cent, the then Government decided to introduce a programme of administrative monitoring and support to turn around the crisis. This consisted of plant level monitoring and support in terms of cash flows, input availabilities and other organisational support like sorting out workers problems. Over a hundred units were monitored and supported from the Ministry of Power. Such dual arrangements, namely support to incentive based systems and also administrative arrangements are generally required, but are critically important in transitional policy periods. From negative growth the electricity sector, particularly thermal plants, turned around in a dramatic way from June '97 to February '98. This programme called PAGER, Programme for Accelerated Generation, Evacuation and Refurbishment was apparently given up with the Government changing and the performance of the thermal sector deteriorated and energy deficits by the end of the year again went up to 12 per cent. The Economic Survey pointed out that power generation growth in the period April-November '98 was 6.1 per cent as compared to 6.6 per cent over the same months in '97, but thermal growth had collapsed to 4.3 per cent and the PLF went down. The available facts strongly endorse the need to have a dual "efficiency" strategy in the short run. The improvement from June

last year and the significant deterioration this year is as follows:

Period	Growth in Thermal Generation		Growth in 97 over 96 minus 8.0	Total Generation
	97 over 96	98 over 97	97 over 96	98 over 97
April	minus 7.2		minus 8.0	11
May	2.6	6.9	2.8	9.9 (Hydel 46.9)
June	9.8	6.1	8.2	9.8 (Hydel 30.2)
July	5.5	5.0	8.4	6.5 (Hydel 14.8)
August	7.2	2.4	7.2	6.8 (Hydel 10.2)
September	6.5	3.6	8.2	0.5
October	8.2	minus 5.6	5.1	0.1
November	5.3	3.5	2.9	6.8 (Hydel 21.3)

Source: CSO

After November 1998 the thermal figures are not publicly available, but the total generation performance this year is as follows:

Period	Growth 98 over 97	Growth 99 over 98
January	7.6	4.5

Source: IIP

Recently in an advertisement profit figures for Central PSU's have been advertised as record figures. But these are profits from the performance in 97-98. A one per cent fall in the PLF leads to a reduction in cash inflow of about Rs. 40 crores and this year's performance will reflect in financial figures released next year. Energy deficits had gone up to 12 per cent by Nov.'98 although on account of demand sluggishness there may have been some decline later.

Long Term Issues

The progress on the side of capital markets for the power sector in the last two years has been good. The author's predecessor was not able to introduce the Regulatory body bill in Parliament which was successfully done in August, 1997. The author's successor first got this implemented as an ordinance, but later on, unfortunately, giving up some critical clauses on rural tariff discipline and on mandatory reform, got it passed as law. The author saw unfortunately, because his experience in piloting the transmission bill, which went through the crucial committee stage when he was minister, was that with discussion and some give and take it was possible to get legislation through multiparty acceptance.

There is now a definite private market for power projects in India and MOP is actively pursuing it. The policy for competitive bidding, the Power Trading Corporation, which will make the availability tariff happen and the Coelho Committee, on distribution are all ahead of us. We must push these rather than the naphtha projects.

The Faridabad and Simhadri in the public sector units were sanctioned and these got through at very low capital costs as compared to say the counter guarantee projects of a comparable kind. Many projects have been approved after that and foundation stones laid, but since international lending for new projects has stopped on account of sanctions there have been no new effective starts in the public sector. These unfair pressures on India have to stop and Government must clearly tell us the costs and ways to meet them. The power plan as approved by the NDC was definitely set back completely in 98-99, by one year and has to be reviewed.

The Paradigm

The paradigm for the infrastructure sectors has to be Market orientation with a strategic focus. As this paper shows, one without the other wills. The strategic focus has to include a transitional strategy and a lot of institution building. This is the lesson of the failures of the Eighth Plan and the last two years. □

National Competitiveness Policy: An Overview

Subir Gokarn

The present paper attempts to provide an overview of the concept of a "national competitiveness policy". It does this in three stages, First, it states some reasonable goals for any such policy. Next, it analyzes the phenomenon of competitiveness by decomposing it first into macroeconomic and microeconomic factors, and then into more narrowly defined forces within these broad categories. Finally, it examines major policy issues with respect to each of these forces. In applying this comprehensive framework, one attain the inevitable conclusion that all policy can be construed as part of a national competitive policy. Going beyond that, however, the analysis allows to identify the roles of each type of policy, macroeconomic and microeconomic.

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The Concept of Competitiveness

Competitiveness has a simple meaning – the ability to compete, or in other words, to do things that one's competitor. In an economic context, this ability can be visualised at various levels of aggregation. At the most basic level, we can think about an individual firm being competitive relative to others in its line of business. At a somewhat more aggregate level, we can speak in terms of an industry being competitive. This immediately takes into the realm of the global marketplace, because an industry located in a particular country can only be meaningfully compared to the same industry located in another country. In this context, competitiveness of a particular industry located in a country would imply the ability of the firms in this industry to compete in the global marketplace against producers from all other countries.

At the highest level of aggregation, one can perhaps think in terms of "national" competitiveness. Broadly speaking, this would indicate the ability of the entire national economic system to operate successfully in the global sphere. One should emphasize that "competitiveness" should not be taken to mean "self-sufficiency". A nation can be competitive even if all its industries are not. National competitiveness does not come from producing everything that the nation needs. It comes from being able to derive the maximum leverage from industries that are competitive. Further, it is sustained by mechanisms that are able to recognize

One should emphasize that "competitiveness" should not be taken to mean "self-sufficiency".

the inevitable decline in competitiveness of specific industries and facilitate the reallocation of resources from these activities to others whose competitiveness is on the rise. Thus national competitiveness can be viewed as having both static and dynamic dimensions.

One might argue that international competitiveness has no great significance for a continental economy like India. Exports, even after three years of very rapid growth, peaked at about ten per cent of GDP. While this ratio may increase slightly after exports return to a more reasonable growth rate from their current slump, it is unlikely to ever reach the levels of, for instance, the East Asian economies. The USA, the largest and among the most open economies in the world, also shows an Exports/GDP ratio of around ten per cent. If exports are never going to provide us the growth impulse that they did for the smaller East Asian economies, why should we care about international competitiveness?

There are two ways to address this question. Both imply that the criterion of international competitiveness is relevant to an economy in which domestic demand predominates. The first is to take a consumer's perspective. Presumably, his interests are best served by being able to consume goods and services at the lowest possible cost. This is most likely to happen when he has access to the products of the most competitive industries in the world, regardless of where they are located. The second is to see our domestic market as part of the global aggregate. If competitiveness is the predominant force driving resource allocation globally, then defying that pressure will only lead to a less than optimal utilization of our productive resources. The point is that, rather than looking at competitiveness only in terms of export performance, one must look at it as an indicator of overall efficiency in resource allocation and utilization.

The essential objectives of competitiveness a policy should be consistent with the static and dynamic aspects of the concept of competitiveness itself. Thus, a national competitiveness policy should define as its goals as follows:

(a) to achieve the allocation of productive resources within the economy in their most competitive uses;

(b) to continually facilitate the process of re-allocation of resources from activities in which their competitiveness is declining to those in which it is increasing.

Having stated the goals of a national competitiveness policy, the next step is to identify and analyze the components of such a policy. There are obviously several factors that influence the competitiveness of a firm or industry. Some of these are amenable to policy intervention, others may not be. The first step in this exercise, therefore, is to visualize a comprehensive framework within which the interactions between the various factors can be understood. Once this is done, one can examine various policy issues relating to the factors influencing competitiveness.

The Conceptual Framework

Figure 1 provides a convenient layout to identify the notion of competitiveness into a set of component factors. It should be pointed out that even though the use of competitiveness has been advocated as an indicator of overall efficiency, in operational terms, the competitiveness of, say, an industry can only be quantified in terms of an indicator based on something observable such as export performance. Thus, the framework explicitly deals with the notion of competitiveness of the industry in question in international markets.

Macro vs. Micro Factors

The factors affecting competitiveness can be first classified into macro and micro categories. The cumulative effects of the macro factors is represented by the movement of the Real Effective Exchange Rate (REER), which essentially aggregates the movements of the domestic currency against the currencies of its major trading partners, controlling for differences in inflation rates. This influence is macroeconomic in the sense that it uniformly affects all sectors in the economy.

The microeconomic factors are collectively represented by the notion of unit cost. This is a measure that is clearly specific to each industry, and perhaps even down to the level of each firm. In this discussion, we confine ourselves to the notion of unit cost at a product or industry level, assuming that firms producing the same commodity would eventually see a convergence in their unit costs.

The point to be made at this first level of decomposition is that competitiveness is the combined outcome of macroeconomic and microeconomic factors. Other things remaining the same, a depreciation in the REER results in an increase in the competitiveness of all industries. A decrease in unit costs, other things remaining the same, results in an increase in the competitiveness of a specific industry. At this first level of decomposition, it is possible to visualize alternative scenarios in which macro and micro factors may either reinforce each other (to strengthen or weaken competi-

tiveness), or neutralize each other.

Decomposing the Macro Factors

There are three factors underlying the REER: the nominal exchange rate, domestic inflation and inflation rates in all the trading partners. The third is obviously outside the control of the policy makers. Therefore, when one talks of competitiveness from a macroeconomic perspective, the behaviour of the nominal exchange rate and the rate of domestic inflation is referred. Both of these phenomenon are essentially related to changes in the stock of money in the economy; the first is the "price" of domestic currency in terms of a basket of foreign currencies, while the second is the price of the domestic currency in terms of a basket of goods.

Clearly, as the stock of the domestic currency increases, its price in terms of either of these baskets should decrease, i.e., the nominal exchange rate tends to depreciate and the rate of inflation tends to increase. Since these movements have the opposite effects on competitiveness of exports—the former tends to increase it and the latter, to decrease it—the combined movements of the two variables may simply neutralize each other. The basic challenge is to appropriate the benefits of a depreciating nominal exchange rate, while deterring the adverse impacts of a rising rate of inflation.

Decomposing the Micro Factors

The right branch of the scheme depicted in Figure 1 represents the role of microeconomic factors in determining competitiveness. Given the macroeconomic environment, which uniformly affects all sectors of the economy, the competitiveness of specific industries is directly related to their ability to reduce their unit costs of production. Clearly, a variety of inputs go into the production process, and the cost of production depends on how efficiently these inputs are used, as well as their respective prices. The figure represents a simplified cost structure taking into account wages, cost of capital, material costs and the incidence of indirect taxes.

Assuming that individual firms are "price-takers" in the markets for the various inputs they use, i.e., they cannot by themselves influence the prices, the microeconomic aspect of competitiveness depends on two sets of factors: (i) how "scarce" or "abundant" specific inputs are, and (ii) how closely the market prices of these inputs reflects their relative scarcity or abundance. To use labour as an example, one could easily visualize a large and relatively poor country such as India being competitive in industries that use labour intensively. Even with this abundant resource, however, there may be certain institutions in place which prevent wages from falling to a level which accurately reflects the labour supply situation. If wages do not reflect the abundance of labour supply, the link between this resource and the achievement of competitiveness in labour-intensive industries is broken.

Clearly, as the stock of the domestic currency increases, the nominal exchange rate tends to depreciate and the rate of inflation tends to increase.

In the context of this decomposition of unit cost, the challenge to microeconomic policy can be stated as follows: to ensure that the prices of inputs closely reflect their relative scarcity or abundance. The deviation between these two constitutes a distortion. Such a distortion may arise from some basic structural features of the market concerned. Because of imperfectly functioning markets, the price emerging may be high relative to scarcity value. In this situation, the appropriate policy objective is to correct the structural problem so as to let a scarcity-based price emerge. Under some circumstances, an argument could perhaps be made that, while the structural problems are being addressed, the government can subsidize the price of the input so as not to hinder investment and production activity. The point to be emphasized is that such subsidization can only be visualized as a short-term complement to the deeper issue of the structure of the market.

The Components of a National Competitiveness Policy

In the introductory section, two goals of a national competitiveness policy: to ensure that resources are deployed in their most competitive uses and to facilitate the movement of resources from areas of decreasing competitiveness to areas of increasing competitiveness were laid out. Against this backdrop, one now looks at the specific components of both types of policy in terms of how they need to be structured in order to achieve their goals.

The bottom layer of Fig. 1 lays out policy issues at the macroeconomic level on the left and at the microeconomic level on the right.

Issues in Macroeconomic Policy

Both components of the REER that are under

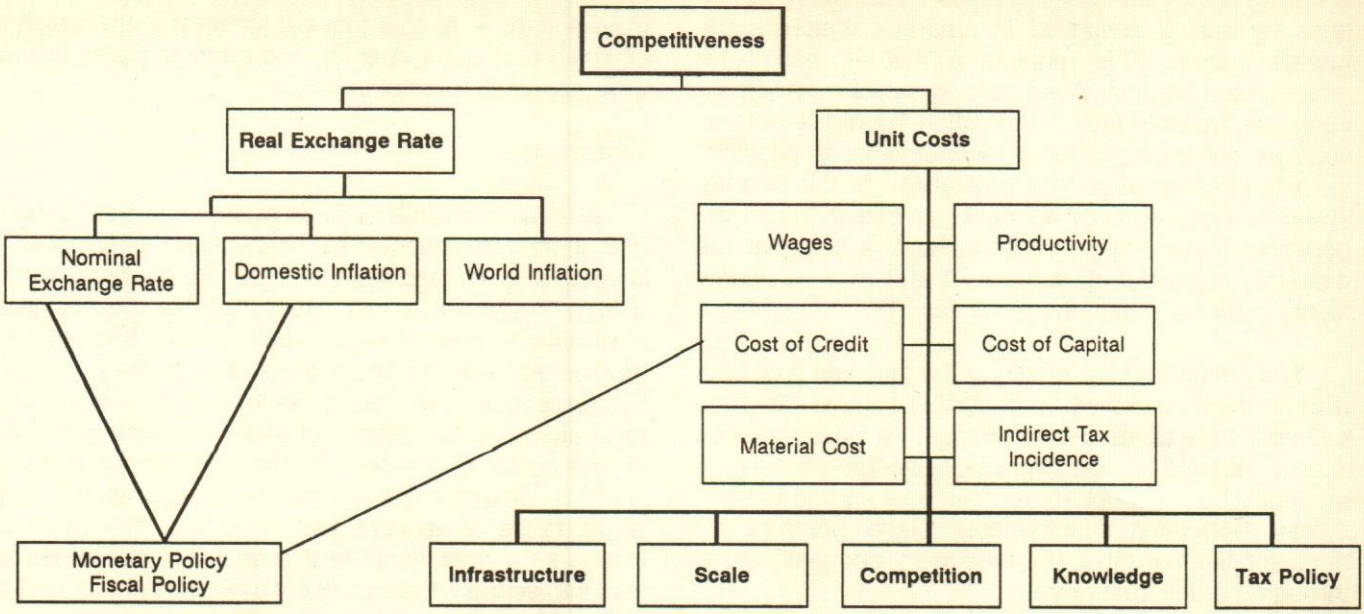

Fig 1. Competitiveness: An Analytical Framework

domestic policy control are directly affected by the stock of money in the economy. As has been stated above, the objectives of macroeconomic policy are quite clear-cut in the context of competitiveness. When capital movements are constrained, the nominal exchange rate should be based on the domestic demand for foreign currency for current account transactions. The rate of inflation should be low and stable. The figure also shows a link between the macroeconomic policy box and one of the components of unit cost, the cost of credit (which also links up to the cost of capital). This link reflects the role of interest rates, which emerge out of the macroeconomic policy scenario and directly affect unit costs.

Thus, from the viewpoint of national competitiveness, the ideal macroeconomic environment comprises a nominal exchange rate that is consistent with current account balance, low inflation rates and low interest rates. This environment is the direct consequence of the amount of money circulating in the economy. So, from the macroeconomic viewpoint, one can think of competitiveness policy as the management of monetary conditions so as to generate these desirable outcomes.

The ideal macroeconomic environment comprises a nominal exchange rate that is consistent with current account balance, low inflation rates and low interest rates.

This sounds quite straightforward, however, there are two major factors which make it potentially difficult to sustain a competitiveness-enhancing monetary regime. Both have been observed to some degree in recent Indian macroeconomic experience. The first is the impact of opening up transactions on the capital account. Clearly, allowing foreign exchange to flow in for investment purposes allows an economy to indefinitely sustain a current account deficit. The nominal exchange rate, which now reflects the combined demand for domestic currency by foreigners, tends to appreciate relative to the level consistent with balance on the current account. At a given level of unit costs, competitiveness suffers because of this appreciation. Clearly, the merits and demerits of capital account convertibility are beyond the scope of this discussion. The narrow point being made here is that as long as capital is flowing in, the nominal exchange rate faces a pressure to appreciate in order to sustain a current account deficit.

Nominal appreciation obviously has a direct impact on national competitiveness. Capital inflows can also stimulate inflationary pressure by increasing domestic money supply. This would obviously cause the real exchange rate to appreciate, thus hurting competitiveness even further. To neutralize this effect, the monetary authorities have to be able to "sterilize" the inflows, i.e., break the link between the expansion of foreign currency reserves arising from the inflows and the domestic money supply. The most effective means of sterilization

is for the central bank to engage in open market operations by selling securities in amounts matching the foreign inflows. This requires a mature market for government securities, something which developing countries typically lack. Sterilization by direct control, such as enhancing reserve requirements, is possible, but will possibly affect the profitability of the banking system adversely. Looking back on recent Indian experience, it is perhaps reasonable to argue that the monetary expansion between 1993 and 1995 was partly fueled by unsterilized foreign inflows.

The second factor upsetting the best-laid monetary plans is the fiscal deficit. To the extent that the monetary authorities are compelled to finance the deficit, inflation is provoked and competitiveness is affected adversely. If monetary policy is not so accommodating, the government's borrowing requirements place pressure on domestic interest rates and thus affect competitiveness through the unit cost route.

Of the issues discussed above, the relative appreciation of the exchange rate is response to capital inflows may just be the price that the economy has to pay to attract substantial foreign resources, which themselves may have a beneficial long-term impact on competitiveness. If this is accepted as a constraint on the nominal exchange rate, then the two requirements that are amenable to policy intervention are the development of securities markets that allow for effective sterilization and the emphasis on keeping the fiscal deficit down.

Issues in Microeconomic Policy

In the context of this analytical framework, the role of microeconomic policies is to create an environment within which resources will flow into their most competitive uses. There are two aspects to macroeconomic policy approach. One is the ability to see where automatic allocative processes, which is basically what the market mechanism is, do function effectively, and then simply create the conditions in which such a mechanism can do its job. The other is to recognize the areas in which automatic processes do not work effectively. As was underscored in the previous section, the concern here is to balance the long-term goal of developing the mechanism itself with the short-term objective of supplanting it by introducing some kind of distortion – a subsidy or a price ceiling, for example.

Conventional analyses of microeconomic policy tend to focus on distinctions by sector,such as trade policy, industrial policy and financial sector policy. We have attempted a somewhat different classification for this analysis. This classification is, better suited to understanding the forces that relate to the basic goals of a national competitiveness policy. There are five microeconomic factors that determine the environment in which producers operate, and address policy issues with respect to each of them.

Infrastructure

It is quite possible to view infrastructure from a macroeconomic perspective. Its inclusion in this discussion is motivated by two factors. First, its availability and quality, in general terms, directly affects the business environment and therefore unit costs. Second, infrastructural services themselves have to be produced by somebody; this raises issues of ownership and regulation, and the impact of these institutional factors on the quality of the service. The objective here is obvious: to ensure adequate and reliable supplies of the whole range of services that constitute infrastructure. However, to operationalize this goal, the policy has to take into account the significant differences that characterize different types of infrastructure.

The first decision has to be made on the "public good" vs. "private good" issue. The properties of non-excludability and non-rivalry that characterize public goods, and usually imply under-provision by the market mechanism, justify public provision of particular services. The government must rank different types of infrastructure on the basis of these criteria and confine its direct involvement in only those sectors scoring high. Services not prone to this problem can be adequately provided by the private sector,provided the right price incentives are provided. The common characteristics of conventional infrastructure are large minimum efficient scales, long gestation and long payback, all of which tend to raise the costs of capital. The government has a role to play in mitigating these costs. In the short run it could do this by way of guarantees or outright subsidies, but it must be borne in mind that the best way of lowering the cost of long-term capital is to foster the development of a wide and deep market for long-term securities. The basic point is that high costs of capital are not a justification for government provision of a particular service because it can simply mitigate this problem for private providers. Ultimately, the question is of quality; to the extent that private infrastructure providers are in a somewhat more equal bargaining situation with their private customers, they may work together to achieve better quality.

A second distinction needs to be made in terms of the regulatory framework. Effective regulation usually involves a continuous process of interaction between the regulator, the provider and the user. For services that are geographically segmented, it is appropriate that the regulatory mechanism be decentralized down to the

geographic limit, whatever it may be. The nature of the service should determine the nature of regulation. Centralization may work in the case of some services, but cannot be seen as the most relevant model in all circumstances.

Given these distinctions, and faced with different types of financial and institutional constraints across the infrastructure sectors, the government needs to evolve a sequence of priorities that is consistent with the goal of national competitiveness. To the extent that infrastructural needs differ across production sectors, such a sequence could be built around tackling the immediate requirements of those sectors that are currently competitive or show promise in the near future. This will make more effective use of the government's limited administrative and regulatory capabilities.

Scale

Typically, the growth of a firm is a good indicator of its ability to compete. It generates more business simply because it does it better than its competitors, The opportunity to grow provides a powerful incentive to the owners/managers of firms to increase their efficiency. In turn, larger firms generate scale economies related to their current volumes of production, as well as to their accumulated experience, or learning-by-doing. As long as there is a strong nexus between growth and efficiency, any policy that provides disincentives to growth potentially goes against the interests of national competitiveness.

The opportunity to grow provides a powerful incentive to the owners/ managers of firms to increase their efficiency.

However, it must be recognized that new industries emerge with the birth of several small firms who bring new ideas, products and technologies to the marketplace. Given the goal movement of resources to such new activities that show the promise of competitiveness, it is essential that the policy does not in any way deter these small entrepreneurial firms from getting themselves off the ground.

An effective way to compromise between the operating efficiency of large firms and the dynamism of small start-ups is to provide incentives to firms wanting to start up. To the extent that such firms face problems in raising capital, there is a case to be made for facilitating institutions, such as venture capital firms, which help such firms get round these problems. Once a firm is up and running, however, there is really no place for policies, which discriminate between small firms and large firms, particularly those, which actually provide firms an incentive to remain small.

Competition

This is a fundamental force in this entire scheme of argument. Obviously, competitiveness itself is a meaningful concept only in the presence of competition. However, there is a practical aspect to the forces of competition in terms of harnessing them in pursuit of competitiveness. We had argued in the previous section that inputs are used most efficiently when their prices closely reflect their relative scarcity. Competition ensures this outcome, because as long as competitive conditions prevail, sellers of inputs are going to bid down prices until they satisfy this criterion. This is true for all markets—product, labour and capital. The relationship between competitiveness and competition is thus an ends and means one. Competitiveness represents the desired outcome and competition is a process, which generates that outcome.

There are, however, situations in which competition does not guarantee efficient outcomes. If the competitive process is to be used effectively, one must understand its limitations. There are two such situations. The first relates to situations of market failure. There are several sources of failure, all of which call for some kind of regulatory intervention to correct them, and in effect, simulate the ideal competitive outcome. These relate mainly to situations in which there are externalities associated with the production activity, information asymmetries between producers and consumers and high transactions. To keep the competitive process working, the government has to have effective mechanisms in place to deal with specific sources of market failure in different activities. These might be collectively classified as a market failure policy.

The second limitation has great current relevance for India. Competition is characterized by a fundamental symmetry. For it to work, producers must have opportunities to enter into a particular activity as well as to exit from it. Competition promotes efficiency by ensuring the survival of only the most efficient producers. For those who lose the race, there must exist relatively easy means to go and try their hand at something else. Forcing inefficient producers to remain in business goes entirely against the logic of competition. For those who survive, they also must have the opportunity to constantly reinforce their strengths and mitigate their weak-

nesses. This argument brings us directly into contact with two sensitive areas of India's current policy debate – exit and corporate restructuring.

There are obvious concerns about the social costs of a free exit policy. The answer does not lie in forcing inefficient employers to bear the burden o keeping workers employed. As the economy moves increasingly into a competitive mould, the resistance to exit becomes a greater hindrance to the dynamic aspect of national competitiveness. If we perceive unemployment to have high social costs, the appropriate means of dealing with it is to have a social safety net, combining insurance, re-training and re-employment assistance, which may be funded collectively by successful producers, but does not impose a disproportionately large burden on individuals. A similar argument can be made for ease and flexibility with respect to corporate restructuring, though in this case the social costs are not as clear-cut as outright exit. The point, however, is that rapidly changing economic environments can only evoke competitive responses if firms are allowed to discover the structure best suited to the environment.

In short one must emphasize that to make competition work, its symmetry must be accommodated. In our terms, "competition policy" consists of three essential elements – ease of entry, ease of exit and ease of restructuring.

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Knowledge

Knowledge is an essential part of the production process, and its productivity depends on how it is distributed across the various components of the process. Conventionally knowledge can be equated with technology, and one tends to view it as being vested in the management of the firm. This view, however, is clearly becoming obsolete. It is now more appropriate to look at "knowledge" within the firm as a complex combination of technology, information, experience, training, and very importantly, as a result of effective processes inside and outside the firm to exchange all these aspects. The more knowledge there is in a firm, and the more easily it flows between people in the firm, the more efficient the firm is going to be.

Conventionally knowledge can be equated with technology, and one tends to view it as being vested in the management of the firm.

Given that knowledge has high externalities, the public-good argument comes into play. Individual firms, cannot hope to fully appropriate the returns from their investments in knowledge-creation, so we could expect them to under-invest in it. However, it is equally true that many aspects of knowledge are specific to certain firms, or even certain activities within it, so its efficiency is going to be affected by its unwillingness to build up its knowledge resources. The appropriate policy position here is to encourage the formation of knowledge-creating institutions that can internalize the externalities at different levels. For example, firms within an industry can collectively share the cost of training workers in a skill specific to that industry. The government clearly has the dominant role in educational and training activities which cover too large a span to be effectively internalized.

Particularly in the context of redeployment of labour and other resources from declining sectors to emerging ones, there is a high premium on knowledge that transcends specific workplaces. The workers who will benefit most from these transitions are those who are able to adapt their knowledge from one situation to

another. Realistically speaking, the majority of industrial workers face the likelihood of being highly discounted in transitions because of their limited adaptability. There is much talk of re-training through institutional innovations such as the National Renewal Fund, but there is good reason to believe that re-training can only be as effective as the original training itself was.

In the context of national competitiveness, the task of "knowledge policy" is to find a balance between situational knowledge and adaptable knowledge, and to work out a system of sharing responsibilities and costs between employers, workers and government in creating this knowledge.

Indirect Tax Policy

This issue has too many dimensions that go beyond the scope of this paper. However, since indirect taxes constitute an element of unit cost, a basic principle can be re-iterated with respect to the promotion of competitiveness. Given revenue considerations, the tax regime should try to minimize distortion, as measured by the difference between transaction price and scarcity value. In this connection, an issue that needs to be explored in the Indian context is the possibility of a structural shift from dependence on indirect taxes to direct taxes. There are well-known problems associated with, for example, the expansion of the direct tax base. However, from the competitiveness viewpoint, a high dependence on indirect taxes for revenue increases the likelihood of distortions creeping into the system, and through them a reduction in the efficiency of the production system.

This discussion has attempted to address major policy issues related to several microeconomic forces acting upon competitiveness through their influences on the unit costs of production. It is clear that the influence of each of these factors differs across sectors, and so one could conceivably argue for a detailed sector-specific approach. However, the discussion also provides an indication of the logical limitations on government intervention, and tries to see policy in terms to complementary roles of government, employers and workers. From a practical policy standpoint, the latter interpretation is the correct one, in our view.

Conclusions

It helps us to understand how (i) how these policies may per se help or hinder the achievement of competitiveness and (ii) how each policy may reinforce or neutralize the effect of other policies. The basic insight emerging from this approach is that the achievement of competitiveness is dependent on the government's ability to co-ordinate policy initiatives at various levels. Policy monitoring needs to ensure that different policies are not working at cross-purposes with each other. There is, however, also the reassuring thought that if one set of policy initiatives receives a temporary setback, the interdependence allows the impact to be neutralized by adjusting some other policy. □

Collaborative Advantage – The Relational Imperative for Competitiveness

P. N. Rastogi

In today's high velocity and intensely competitive business environment of today, a firm's competitive viability depends on its ability to establish and sustain mutually beneficial cooperative relationships with other firms. The present paper delineates the nature, contexts, rationale, forms, modes and frameworks of such relationships toward the creation of value. The concepts of competition and value net, as well as, alliance networks are highlighted in this context. Factors and issues underlying the creation of collaborative linkages are outlined and the essence of the search for collaborative advantage is identified in the present paper.

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Introduction

Successful companies today, no longer just add value; they generate new sources of value through reconfiguring their relationships among a constellation of business actors. The constellation includes not only a given company and its customers but also the firm's suppliers, business partners, and even direct and indirect competitors. The reconfiguration of rules and relationships, among the actors in the constellation, enables their mobilization for the creation of value, in new forms, and modes. The ability to reconfigure, or redefine, rules and relationships among its constellation of business actors/entities, thence, becomes a firm's generic capability – a capability for imaginatively creating and managing relationships, for the creation of value, in new and innovative ways. Like databases, business success is increasingly becoming relational and one of collaboration.

The case of IKEA, with its dense web of linkages with its customers and suppliers, is a relevant illustration in this context (Normann & Ramirez, 1993). The case of McKesson Corporation is another outstanding example (discussed below) of business success, based on cooperative relationships.

Relational Architecture of Success

McKesson Corporation is a pharmaceutical firm of $7 billion distributor of drugs, healthcare products, and other consumer goods, is a very successful example of reengineering, and collaborative advantage. Faced with severe competition from large drug store chains, the company first focussed on a rudimentary order-entry system at one of its warehouses. The system dramatically cuts the costs of processing orders, by expediting

* The present paper (being part of Rastogi, 1998) examines these issues in details.

the steps of checking inventory, calling in an order, manually recording the order, and eventually packing and shipping it. The company soon discovered, that the system could also specify how to pack orders, so that, they coincided with the arrangement of customers' shelves. Doing so, made restocking more cost efficient. These successful uses of information technology (IT), led to others. Through McKesson's help, the drug stores were able to offer their customers better prices, a more targeted product mix, and better service responsiveness to their local areas. Since the system was introduced in 1976, sales to pharmacies soared from $900 million, to over $5 billion. The more efficient ordering systems, allowed the firm to reduce its warehouses from 130 to 54, eliminate 500 clerical jobs devoted to taking telephone orders, strengthen its customer base, and reduce the average number of shipments per customer from two per day to two per week, while, lowering its own, and the customers' inventory costs.

Extending the Company's Cooperative Links

The close and productive links with customers, were followed by the creation of new value-adding links with its own suppliers, as well as, with insurance companies. The company recognised that the up-to-date information on sales, had great value to product managers of consumer goods manufacturers, and proceeded to sell this information to its own suppliers. Suppliers used it to make more timely shipments to McKesson, in much the same way, as the company had done with the drug stores. Computer-to-computer (EDI) ordering from suppliers, enabled McKesson to reduce its staff of buyers from 140 to 12. Suppliers, in turn, could schedule their production more efficiently, and streamline their inventions. The company also innovatively used its computer system, to help process insurance claim applications for prescription reimbursement. This strengthened the ties among insurance companies, consumers, and drug stores, by speeding payments and smoothing administrative problems. McKesson's total network of cooperative links, thus now includes manufacturers, distributors, retailers, consumers, and third-party insurance suppliers.

The power and success of McKesson, is based on the fact that each player in its network, has a stake in the other's success. The firm sees the entire network, not just one part of it;—as one competitive unit. The firm's managers looked for ways, the resource at one part of the chain, could be used in another. They do not consider opportunities only within the unit defined by ownership; they see beyond the corporate boundaries.

The company knows that its own fate, depends on that of its suppliers and customers. It, therefore, monitors competitive dynamics throughout the relational network and tries to overcome weaknesses, wherever, they occur. When all the partners are strong the entire structure of collaborative relationships, can cope with even the most severe competition.

Japanese trading and other leading companies are also organised as cooperative networks. Toyota, for example, directly produces only 20 per cent or so, of the value of its cars; the rest comes from its stable suppliers.

Logic of Inter-firm Cooperation

Cooperation among firms for mutual collaborative advantage, is based on sound business logic. The bases and rationale of this logic, may briefly be outlined as follows:

(1) Cooperative links with other firms, enable an enterprise to focus on developing its core competencies/capabilities. The enterprise outsources those activities that can be performed quicker, more effectively, or at lower cost, by others.

(2) By using a network structure, a company can operate an ongoing business both efficiently and innovatively, focussing on those things it does particularly well, and contracting with other firms for the remaining resources, or requirements. It may thence, also be able to get rid of minimally productive assets.

(3) Alternatively, a company can enter new businesses with minimum financial exposure, and at an optional size in the light of its given and distinctive competencies.

(4) Inter-organisational cooperative implying a combination of internal and external, complementary and supplementary resources; can result in powerful synergy effects of value. It can also reduce expenditure on parallel research, development, or promotional activities.

(5) Inter-organisation cooperation can also cut down fixed, and/or transaction costs, through a joint use of costly facilities, or resources. In the case of R&D, such a cooperation also enables the risks to be shared, and reduced. Alliances offer a cheaper and potentially faster way, for developing new products and processes, both within, and across countries.

(6) Cooperative R&D, implying a merging of technological and production skills, from different companies; enhances the innovation process. Cooperative R&D enables the partners, to reach a critical mass of human and financial

resources, needed to undertake large projects (Rastogi, 1995).

(7) Cooperative relationships among firms, in fact, enable them to address effectively their difficulties, across a wide spectrum of tasks and activities in design, manufacturing, distribution, marketing, service and product development, among others.

Triangular joint ventures involving companies, or parts of companies, in Japan, the USA, and Europe; are growing. Such 'trilateral consortia' are being formed in nearly every area of leading edge industry, including biotechnology, computers, robotics, semiconductors, jet engines, etc., (Ohmae, 1989). They are manufacturing mosaics. They are redrawing business boundaries. Networking of companies based on alliances, partnerships, agreements, research and technical cooperation, is a growing trend in industrially advanced countries. Olivetti company of Italy, for example, has over fifty such arrangements. Competitive position of firms, no longer depends on their internal resources only, but also on the pattern of relationships with outside units.

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Information Technology and Cooperative Strategy

Specifically the change in transaction costs resulting from use of IT, has led to increasing reliance on cooperative strategy by firms. PCs, user friendly languages, and inexpensive software packages, provide wider access to information power to small organisations, and to the lowest organisational levels, very economically. Data standards, and bar codes, enable rapid, inexpensive, accurate capture and use of information in electronic form, thereby lowering transaction costs between organisations. Information networking enables instantaneous sharing of information between partnering organisations. Computer-aided design (CAD) improves speed and economy of response to customer needs, by improving coordination between organisations in design functions. Computer-aided manufacturing (CAM) leads to use of just-in-time practices, between organisations. IT simply makes it easier to communicate, share information, and respond quickly, to market changes. It facilitates value-added-partnerships (VAPs), but does not create them, by itself.

Cooperative links with Suppliers

In increasing number of industries, supplier relationships are changing from adversial to highly cooperative. Firms are relying on fewer suppliers, and establishing long-term relationships with, them based on trust and mutual benefits. Suppliers and buyers, in such cases, are encompassed within the extended boundaries of each other.

Wal-Mart, through close and creative relationships with suppliers, ranging from apparel, and lightbulbs to a wide variety of products has revolutionized retailing. In the case of apparel company, Wal-Mart increased unit sales and inventory turns, by nearly one third, by implementing a quick response system. With GE, which supplies lightbulbs, the firm used EDI (Electronic Data Interchange) to give daily inventory status resports by warehouse, and let GE handle planning and ordering inventory, at each warehouse. Wal-Mart's inventory carrying and transaction costs were substantially reduced, working capital productivity increased and stockouts and lost sales, become insignificant. Wal-Mart downloads weekly POS (Point-of-Sale) data to other vendors, reporting sales volumes, prices, location, and timing, from its more than 2,000 stores. A number of these vendors have redesigned their manufacturing, and replenishment processes, to reduce the costs of their own, and Wal-Mart's logistic operations. This has resulted in substantial cost savings in the entire value system. These savings are shared by partners in these relationships.

Ford, sole sources, certain components for several years, or, even for the life of a particular vehicle category. The suppliers are required to interface with Ford *via* EDI, and use a particular CAD/CAE system. The resulting relationships are based on cost transparency, and are cooperative and mutually beneficial. Cost savings resulting from supplier reengineering of component or process, often in association with Ford, are shared.

Benetton, which operates some 5,000 retail stores in more than 75 countries, provides an example of cooperative linkages with both suppliers and buyers. The company sources most of its manufacturing operations from over 200 dedicated suppliers. It sells through retail outlets largely owned and managed by outside investors. For planning and coordinating its activities among numerous partners, the company extensively uses. IT networking, and CAD/CAE systems. Purchasing and certain dyeing and cutting operations, which invol-

ves proprietary technology, are performed in-house, as they provide economies of scale. The firm's retail distribution is coordinated by some 75 agents worldwide. These agents function as independent entrepreneurs. Such an architecture of extended boundaries and cooperative relationships, has enabled this company to provide quick response, flexibility, lowcost, and high level service.

An example of a business forging direct links with it ultimate customers, is provided by Japan's National Bicycle Company (Moffat, 1990). The company makes many of its bicycles to order. Customers are measured on a machine in the dealer's showroom, which is part of a CAD system. Customers also select the specific make and model of brake, derailer, chain, tires, colour, and personalised name. The order is electronically placed directly with the manufacturer. The latter can produce a made-to-order bicycle in three hours.

Saturn Corporation, a part of General Motors, also does the same. A Saturn customer, assisted by a sales person at a computer terminal, places an order for a car with specified options and colour, directly into the company plant's production planning and inventory control system. Made-to-order, rather than made-to-inventory, is a form of a company's direct linkage with its ultimate customer.

Linkages with Customers

A classic example in this context is that of American Hospital Supply Company. Its interorganisational information system with hospitals, formed the basis of a long term competitive advantage. AHS recognized that half the cost of purchasing supplies for hospitals, was associated with acquiring and tracking the right information for accurate billing to patients and insurance companies. As a result of its ability to handle effectively the ordering and inventory planning functions of hospitals, AHS was able to provide them with considerable cost savings and convenience. The company grew exponentially many fold in less than ten years.

Westinghouse leveraged its electronic utility industry specific expertise, to achieve an advantage over in-house maintenance groups, in delivering maintenance services consistent with regulatory compliance to electricity utility companies. The company uses IT networking to realize economies of scale in service delivery, and creates considerable switching costs for the customers. As part of its service excellence, the company has created a centralized diagnostic centre, employing expert systems linked directly to its customers' equipment with sensors (Bradley, 1993).

Link with Competitors

These relationships are mostly initiated to meet competitive market pressures jointly, for mutual benefit, through enhancing respective competitive advantage through cooperation. Several large diversified global companies, for example, cooperative for specific production, or marketing advantage objectives, while competing with their partners in areas outside the specified objectives (Bradley, 1993).

Large engineering and construction companies, such as Bechtel, often form bidding consortia that involve construction subcontractors, and architectural engineers. The same companies may be competing bidders on other occasions, particularly, when the bidding can be unbundled. Planning and coordination of complex projects involves extensive use of IT networking, project planning software, CAD system, and so on.

The consulting industry, also, forms consortia to prepare proposals, conduct bidding, and implement large projects. Such projects usually involve diverse and specialized types of expertise and skills. The same companies may compete against each other in bidding for other projects. IBM, and Apple, though serious competitors, cooperate with one another in terms of joint ventures in production, marketing, and technology in specific designated areas. Similar examples of multilateral cooperation between IBM, Apple, Motorola, Intel, and Microsoft, are numerous. Cooperative linkages among competing firms involve considerations of competitive advantage, as well as, strategic necessity of being and becoming viable.

Collaborative Advantage

This is most common in Japanese industrial systems. Collaborative advantage is simultaneously characterized by both high level of competition and cooperation. Firms compete intensely in domestic and global markets, and at the same time, cooperate with one another in long term R&D. A recent example is that of 60 major Japanese companies collaborating together in the development of Intelligent Manufacturing Systems (Harrison, 1994). The companies are working together to understand the challenges and problems which the next generation of manufacturing systems will have to overcome, and how to tackle them. Four key areas have been defined in this context:

- Capture and organisation of existing knowledge of best practice(s);
- Standardisation of production systems,

management, design, manufacturing, and supporting information systems;

- Development of critical areas of technology for the next generation of manufacturing systems;
- Relationships between people/machine/factor environment.

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Companies share knowledge in areas which are not viewed as key to firm-specific competitive advantage. The collaborative arrangement is meant to enable the companies to share the high costs, and risks, of R&D in new areas. The knowledge so generated, is precompetitively shared. Firms are free to use this knowledge for developing and producing new products, or production systems, toward their firm-specific competitive advantage (Rastogi, 1995).

Contexts and Modes of Cooperative Relationships

Modes of inter-firm cooperation between firms within a country, and or countries, may vary widely. The major modes of relational linkages between, or, among firms in a network, may be listed as follows:

(i) cross-licensing arrangements,

(ii) second sourcing,

(iii) joint production,

(iv) technological cooperation,

(v) inter-firm transferability of certain technologies (e.g. CAD/CAM),

(vi) joint use of marketing and distribution channels,

(vii) OEM agreements,

(viii) joint sales based on complementary product portfolios,

(ix) national research and development projects, and

(x) cross-national R&D, or technology development projects.

The above modes of relationships are not mutually exclusive. These forms and contexts of cooperative arrangements, may be briefly outlined as below:

(1) Similar companies, in similar industries, may pool their resources, to gain a benefit that may be too costly for any one of them, to acquire alone. Obtaining access to an advanced technology, is a relevant example in this context.

(2) Two (or sometimes more) companies may form a joint venture, to capitalize on an opportunity, that may require complementary capabilities from each of them. The venture partners may poor their technological, manufacturing, marketing, or distribution resources, for this purpose.

(3) Companies may form value-chain partnerships, such as, supplier-customer relationships discussed earlier. Companies in different industries, with complementary skills, or resources, link their capabilities to enhance the delivery of value to ultimate users.

(4) Companies can participate simultaneously in many kinds and modes of relationships, and assume a variety of roles. An interesting example in this context is that of Immarsat, a consortium of 65 partners, that operates a telecommunications satellite. Partners here are simultaneously owners, investing capital; customers, routing calls through the satellite; suppliers of technology to the venture; regulators setting policy; and competitors, offering services similar to Immersat's (Kanter, 1994).

For collaborating actively to generate and share advantages, the companies need to develop appropriate mechanisms, in terms of, supportive structures, processes, and skills. These mechanisms must be articulated, in terms of, multiple ties at multiple levels, toward ensuring and facilitating communication, coordination, control, and resolution of organisational, and/or interpersonal differences. The cooperative relationship needs to be carefully nurtured, by deploying adequate number of people with relevant cultural, technical, and conceptual skills, to create a dense web of interpersonal relationships; and an internal infrastructure, that facilitates mutual learning. Real value, or, substantial collaborative advantage, can be achieved only when the relationship focusses on creating value together, rather on mere exchange of benefits. The relationship needs to be nurtured, and managed in human terms, and shared aspirations; and not merely in financial terms and criteria.

Alliance Formation Factors

Alliances among companies involve an alignment of their capabilities and technologies, toward shared purposes and goals. Being a desired and good partner, has become a key corporate asset, a key capability, for a company's collaborative advantage. For this reason, a firm needs to consider carefully several relevant factors in this context. These factors revolve around the following basic elements:

(a) the degree and extent of complementarity between the product portfolios of potential partners;

(b) the degree and extent of support, that one firm can draw from the infrastructure of service, and marketing functions, of the other;

(c) the degree and extent of technological, and manufacturing synergy, obtainable from the relational linkage,

(d) the degree and extent of commonality in the geographical markets, presently being served by each firm,

(e) the degree and extent of mutual trust and confidence, that may potentially exist between the partners, based on their experience, understanding, and frames of reference.

The potential benefits from the alliance, would then, depend on the extent of the partner's complementarity, in terms of products, services, and marketing. The benefits would also be greater, if the potential partners are dissimilar, in terms of the markets being served by them. For example, in the Mitsubishi-Daimler-Benz alliance in early nineties, Mitsubishi wanted to have access to the strong service networks of Daimler-Benz in Europe; while, Daimler-Benz wanted to benefit from the tremendous technological capability of Mitsubishi. In this way, the alliancement the requirements of both the partners, in terms of their perceived mutual benefits.

Strategic alliances usually emerge in situations, where the product development costs are high, the product development cycle is long, the foreign markets require significant familiarization and sources of parts, and the risks are relatively high. Increasingly, some form of joint venture, is evidenced when companies from two or three countries (trilateral alliances between firms in USA, Japan, and EEC), commit assets (finance, access to markets, land, equipment, and technology etc.), share management responsibility, participate in the commercial risk, and, share in the earnings and other benefits. An equity joint venture involves setting up an independent corporate entity under the laws of the country. It has its own personnel, facilities, assets etc., with liability limited to the entity's assets. In a contractual joint venture, partners simply enter into an agreement to cooperate to achieve a purpose for a period of time, in one or more of the following areas: capital assets, technology assistance, manufacturing, training, consulting, engineer, R&D, turn-key operation, and so on.

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An enterprise may be viewed as a player in a business game. Other players in this game are its customers, suppliers, competitors, and complementors. Complementors are those players, which provide complementary rather than competing products and services. Examples of complementary products/services include cars and auto loans, televisions and video-cassette recorders, televisions shows and TV guides, fax machines and phone lines, phone lines and wide-area networking software, bread and butter. The business game may be visualised in the form of a schematic map, termed as the Value Net (Brandenburger & Nalebuff, 1996) as shown in Fig. 1.

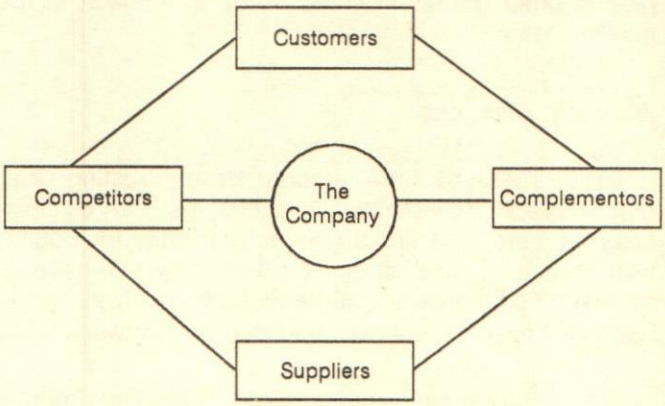

Fig. 1. The Value Net

The value net reveals two fundamental symmetries. On the vertical dimension, customers and suppliers play symmetric roles. They are both the company's partners in creating value. On the horizontal dimension, there is another symmetry. Complementors and competitors are the mirror image of each other. In the game of business

tion, and governance structure (Gomes-Casseres, 1994).

Networks are often created to maximize joint volume, in order to exploit economies of scale. Some examples, in this context, may be cited as follows (Gomes-Casseres, 1994):

(1) Swissair's alliances with Delta Air Lines, Singapore Air Lines and SAS: to increase bookings on transatlantic and European-Asian flights, and to combine the procurement and maintenance of air planes.

(2) General Motor's network of partners in automobiles, which includes Toyota, Isuzu, Suzuki and Saab; competes globally with a group of Ford partners, consisting of Nissan, Mazda, Kia, and Jaguar.

(3) In the multimedia field, an array of alliance groups has emerged since 1992, as the computer and communications industries have converged. Computer companies have joined with consumer electronics companies, cable TV operators, telecommunications providers, and entertainment companies, to develop new products and services.

(4) In the personal computer field, probably the best known network, or web, has been that of Microsoft and Intel. In this network/web, channel partners, and training providers, combine to deliver the overall value proposition of a Windows PC. Other networks, oriented around the use of Internet, are emerging.

Emerging Factors

What has led to the emergence of alliance networks, or groups? Among the factors favouring the formation of international alliance groups, the following may be noted.

(1) Need of the companies competing globally, to keep abreast of important external developments, and to influence these developments, in their interest.

(2) The growing complexity of products and services, and of their design and delivery. Sophisticated products, today, contain components incorporating different and specialized technologies. Similarly, services today, combine several knowledge-based specialized skills, in their performance. Analogously, businesses today, rely for their raw materials, marketing, or distribution, on people with diverse technological or market-specific skills. Finding and assembling all these assets, within a single business enterprise, is neither possible, nor even desirable.

(3) The greatest advantages of specialization, and of scale, are often realized at the component, rather than at the system level. Companies, may therefore, do their best to focus on the component level, while forming relationships with one another, in order to manage system-level interdependencies.

Companies may do their best to focus on the component level, while forming relationships with one another, in order to manage system-level interdependencies.

(4) In emerging industries, various technologies contend for acceptance, and market share. The outcome of such competition, often depends on, the number of companies adopting each technology. Alliance groups help contending companies promote their technologies, and gain the critical mass necessary, for inducing more businesses to use their design.

(5) A company's linkage with local enterprises in various markets, helps it in spreading its costs over larger volumes. The linkage, also enables the company to gain access to skills, and assets, in different nations.

(6) New technologies are creating links between industries, that were formerly separate. Networks make possible for specialists in each technological field, to cooperate and utilize new opportunities much faster, than if each were to try to acquire industry-specific skills and assets of others, in single enterprise, or joint venture situations.

The foregoing, and similar advantages, are not open, or available, to companies in bilateral cooperative alliances. Alliance networks, or groups, thence, represent the latest form and mode of the firm's search for collaborative

Alliance networks, or groups, thence, represent the latest form and mode of the firm's search for collaborative advantage.

advantage, in an increasingly complex, uncertain, and fast changing world. The collaborative advantage, is indeed, an important means of, and a needed capability for, coping with a turbulent world of global business. But, the search for collaborative advantage, may however, sometimes take unusual and creative forms. An example of a novel, and unconventional way, of search for collaborative advantage, may be outlined as next.

Search for Collaborative advantage

Many firms have initiated novel and imaginative searches for purposeful collaboration (Moore, 1996). In 1994, when Paul Kefalas became CEO of Asea Brown Boveri, ABB Canada, he found a region suffering from stagnant sales. Apparently, the market for the company's products – power generation, electricity transmission, and distribution systems, was saturated. The usual approach to reinvigorate the company's market, would have been to focus on improving products and processes. Kefalas did something new and different. He asked his managers to look outward to the business environment, the company hoped to serve. ABB approached a number of leading companies, and asked each one, to share its strategy with them.

In one case, a large mining concern was struggling to reduce production costs, and create safer working conditions. ABB collaborated with this mining firm, to produce a system of mining robots which can be controlled by technicians in their offices, remote from the mine. Kefala's novel initiative resulted in establishing more than a dozen major partnerships with customers, including several joint ventures, by the end of 1995 i.e., scarcely a year after he assumed charge. In the meanwhile, ABB's Canadian sales recorded a strong growth.

Thus ABB's efforts emphasizes the exciting and powerful theme of creativity, and its role in and for competitive advantage (Rastogi, 1996).

Conclusions

Firms' search for collaborative advantage stems from their imperative needs to spread risk, increase flexibility, enhance innovation capability, reduce complexity, and create and exploit new opportunities. They need to become learning organisations in this context (Rastogi, 1998).

Collaborative arrangements, in turn, ranging from joint ventures to alliance groups, webs, or business ecosystems, influence and shape management focus, organisational structure, performance measurement, and information systems. They represent a whole new way of thinking about industry structure, interorganisational relationships, and creation of value. They can create enormous wealth and power, which however, are quite different from that of traditional monopolistic returns. Monopolistic strategies seek to acquire wealth and power at the firm level through economies of scale, capacity expansion, acquisition of competitors, and predatory pricing. In contrast, the creative collaborative arrangements, strive to create and catalyze, increasing returns for the group/web/ecosystem of firms.

The essence of the search for collaborative advantage lies in identifying, and improving, industry value chains. More importantly, however, it lies in an active generation of new value chains. Enterprises need to scan for new opportunities, for dramatic performance improvements in their business. For this, they need to envision new situations apt to emerge, if all the direct and complementary capabilities were reorganised, and new technologies, markets, customers, and regulatory standards, were in place. In this way, they may invent, and develop, new sources and modes of creating value, through new businesses, markets, industries, and capabilities (Rastogi, 1999).

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Trade Liberalisation & Export Competitiveness of Indian Manufacturing

M. Suresh Babu

Developing countries were forced to pursue more liberal policies to reap the benefits from trade. The present study attempts to examine the impact of trade liberalisation on the export competitiveness of Indian manufacturing industries. Examination of price competitiveness reveal that liberalisation policies of the eighties have failed to impart price competitiveness to most of the commodities questioning the effectiveness of 'across the board' policies. Departing from the conventional measures, the study uses a measure of net foreign exchange earned to examine the competitiveness in the nineties. This measure is relevant in the context of more open economies. The results suggest worsening of competitiveness in the nineties in certain industries which prima-facie might look competitive when the conventional measures are employed. These results indicate that hindrances exist obstructing the percolation of the macro policies.

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Introduction

The impact of trade liberalization on the competitiveness of India's manufactured exports has been analysed herein. Two phases of liberalization are considered: the first phase starting in the mid eighties and an accelerated second phase of early nineties. Temporal comparisons of export performance and indicators of competitiveness are provided to draw inferences on the effectiveness of the changes in policy environment.

Evolution of Liberalisation

The dynamic interaction between growth, industrialisation and openness raises important questions about the basis for international trade in manufactures as industrialisation advances, which in a given country will depend partly on the policies pursued.

Far-reaching changes have been seen in international economic conditions altering the composition of traded goods and services. These changes revolving around the phenomenon of globalisation of production, investment and trade resulted in a greater share of services and knowledge intensity in final output and tailoring of production cycles to specific market demand for goods and services. The selectivity of trade practices in developed nations were either country based or product based, the former resulting in various forms of quantitative restraints and tiered preferences and the later in non-tariff barriers. This system of managed trade led to a formal evolution of regional trading groups in Europe and North America. These regional blocks embrace the newer dimensions of international transactions such as services, intellectual property and foreign direct investments (UNCTAD VII, UN 1992).

After the recession and stagnating trade in early 1980s, growth of world output and exports gained momentum as the decade unfolded. The volume of world exports increased on an average at an annual rate 6.5 per cent in 1985-90 compared to 2.3 per cent in 1980-85. Developing countries like registered annual average growth rate 9 per cent in 1985-1990. Against this background of the international trading scenario the trade liberalization measures undertaken in the Indian economy are considered. The desire to provide protection to domestic industry from foreign competition has been the overriding principle behind trade policy until 1970s. During this period the focus of trade policy was on regulating the utilization of scarce foreign exchange through quota restrictions. This implied licensing for all categories of imports, catered to both capital goods and intermediate goods.

The desire to provide protection to domestic industry from foreign competition has been the overriding principle behind trade policy until 1970s.

In order to lessen the anti-export bias imposed by this import policy, some alleviating policy measures were adopted, for example the Registered Exporters Policy (REP), to provide special import licenses to exporters. In addition to these some duty drawbacks and tax concessions were also available to exporters. But a complex system of excise and corporate taxes distorted the incentives. Many of the anomalies of the policy regime were brought to light by a number of official committees in late 1970s and early 1980s.

In an attempt to inject an element of stability into the policy regime there was a switch over to the announcement of trade policy every three years instead of every year in the eighties. In the import-export policy of 1985 an increasing number of capital goods, intermediate and raw materials were added to the open general license lists. Tariffs on an average increased steadily though this was accompanied by an increase in the number of products subject to reduced duties under exemption. In general this trade policy focused on the liberalization of import of capital goods with view to facilitating the process of technological upgrading of Indian industry particularly for exports.

On the export front, the duty drawback scheme which compensates exporters for import duties and the cash compensatory scheme which compensates for various domestic taxes were streamlined. The scheme for subsidising the use of domestically produced raw materials—the International Price Reimbursement Scheme for Steel—was extended to basic steel products and alloy steels in 1986 and a proposal to extend the scheme to other raw materials such as aluminum and copper was also announced. The flexible exchange rate policy after 1985 was also intended to have a positive impact on exports. In the import-export policy of 1988 liberalized access to machinery and equipment for selected export industries was extended to more industries like electronics, tea and silk. Moreover, for the first time some selected capital goods for exporting industries were allowed to be imported without clearance from the indigenous availability angle. Thus it can be noted that the policy environment underwent major changes in the eighties. The second phase comprising economic reforms in 1991 were intended to provide a major role for the private sector, induce an element of competition, and improve efficiency as well as competitiveness of the industrial sector. The emphasis was to eliminating quantitative restrictions for example delicensing raw materials reducing tariffs, etc. The tariffs categories have been reclassified with emphasis on streamlining and simplification. With an objective of accelerating the pace of reforms and sustain high export growth the measures for trade promotion and further simplification of procedures were adopted. Exchange rate policy too witnessed far-reaching changes like convertibility in the current account. The trading scenario changed in the nineties signaling a departure from the past closed import-substituting regime.

Trade Reforms

The reforms in trade and industrial policies ushered in a new environment for international trade in India and provided enhanced opportunities to the domestic procedures to derive maximum benefit by increased competition. Some broad indicators of the industries affected by the change in the policy regime, enables identification of the industries which showed some positive response to the reforms, the export competitiveness of these industries being examined next.

Since 1991, even though industrial growth rate picked up after a down turn in 1991/92, the average rate of growth is less compared to the eighties. The average rate of growth for the six-year period of 1992 to 1997 is about 7.2 per cent compared to 8.87 per cent during 1985 to 1990, though there has been much year to year variation. Within the industrial sector the growth rate of capital goods sector registered a sharp decline, while consumer durables maintained almost the same levels of growth for the above said period. The only segment of the industrial sector which registered high growth rates in the nineties, compared to the eighties, is inter-

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mediate goods. Thus it can be seen that in the second phase of reforms the growth rate of industrial output is less compared to the first phase of liberalization.

Employment

While employment in the factory sector grew at a compound annual growth rate of 3 per cent during the period 1961-1981 it declined to 1.6 per cent in 1981-91. In absolute terms, the employment has increased from 71.11 lakh persons in 1981 to 83.18 lakh persons in 1991, but it can be noticed that in the mid-eighties employment in absolute terms declined especially in 1984. Notably, the groups like beverages and tobacco, textiles, paper and paper products registered drastic fall in the growth rate of employment in contrast to leather and non-metallic minerals. The absolute fall in employment in traditional industries like food products, cotton textiles, jute textiles, wood products, and paper products is explained by the fact that a number of manufacturing units became sick and were closed down during this period (Gupta, 1992).

Exports and Imports

The rate of growth of capital goods and intermediate goods imports was high during the first half of the eighties. While the overall imports registered an average growth of 4.2 per cent for the period 1980-81 to 1985-86 the capital goods imports grew at 9.1 per cent per annum and intermediate goods at 6.1 per cent per annum. An examination of the commodity composition of imports reveals that machinery and transport equipment which accounted for 25 per cent of India's total imports in early 1970s regained its share after a decline in mid seventies. While the share of chemicals remained steady through out the period, iron and steel which accounted for 9 per cent of total imports in 1970-71 accounted for only 5.4 per cent in 1990-91.

Exports during the eighties grew at an average annual rate of 6.4 per cent with the growth rate in post 1985 period being significantly higher than the earlier period. Manufacturing exports grew at an average rate of 7.9 per cent per annum which is higher than the average growth rate of output for the sector. The average growth rate of chemicals exports (16.7 per cent) was also faster than the growth of output in the sector. A characteristic feature of the eighties is that engineering goods exports, traditionally an important component of the export sector, were stagnant especially in the first half of eighties. Leather exports another major component of the export basket grew faster in the first half of the eighties and slowed down in the latter half but grew at an average rate of 6.9 per cent per year during the eighties.

Changes in the commodity composition of exports are reflected in the percentage shares of commodities in total export as revealed in Table 1. It can be seen that chemicals, leather and leather manufacturers, pearls and precious stones and apparel and clothing accounted for higher share in the eighties replacing traditional export items like jute manufacturing and textile yarn and thread. It should also be noted that the share of machinery, transport equipment and mental manufacturers have also

Table 1: Major Items of Manufactured Exports

(percentage shares)

	1970/71	1980/81	1985/86	1990/91	1995/96	1996/97
Cotton Yarn fabrics made up	9.25	6.08	5.27	6.45	8.10	9.40
Ready made Garments	1.89	8.20	9.79	12.32	11.56	11.30
Coir Yarn and Manuf.	0.85	0.25	0.31	0.15	0.20	0.18
Jute Manuf.	12.38	4.92	2.40	0.92	0.58	0.46
Leather and Leather Manuf.	5.21	5.81	7.07	7.99	5.44	4.72
Gems & Jewellery	2.93	9.21	13.80	16.12	16.59	14.30
Chemicals and allied pdts	1.89	3.35	4.57	6.48	9.26	9.65
Machinery, Transport and Metal Manuf.	12.90	12.32	8.76	11.89	13.71	1.54

Source: Economic Survey, various issues.

Table 2: India's Share in World Exports of Principal Commodities

Commodity	1970	1980	1985	1990	1995
Iron Ore & Concentrates	6.7	6.3	7.8	7.6	8.9
Organic Chemicals	0.1	0.1	0.1	0.3	0.7
Inorganic Chemicals	–	0.2	0.1	0.2	0.3
Dyeing, Tanning & Col. Materials	0.5	0.8	0.8	1.2	1.3
Medic. & Pharma. Pdts.	0.4	0.8	0.8	1.2	0.4
Leather	13.4	10	7.9	4.8	3.4
Mfrs. of Leather	0.6	6.3	16.4	13.4	6.9
Textile Yarn	4.1	2.3	2.1	2.1	2.6
Cotton Fabrics (Woven)	6.8	5.3	4.8	3.7	3.4
Woven Fabrics	4.8	0.5	0.2	0.7	0.8
Textile Fabrics (other than cotton and man made)	0.8	6.4	4.8	2.3	2.5
Pearls & Stones	2.2	3.1	9.6	9.8	12.6
Articles of Apparell and Clothing		1.8	2.3	2.3	3.2
Total Exports	0.6	0.4	0.5	0.5	0.6

Source: Economic Survey, various issues.

increased in the nineties after the decline in the mid-eighties, excepting for the terminal year.

Viewed from a different perspective, the movement of India's share in world exports is not encouraging as shown in Table 2. In contrast to 1970 when India's share was 0.6 per cent of world exports in 1980 it came down to 0.4 per cent. Though there was a slight improvement in 1995, this has only helped to reach the share it had in 1970. A closer examination reveals that India's share has increased with respect to chemicals exports like dyes and medicinal and pharmaceutical products. Regarding leather exports, though India's share declined in raw leather its share increased in the case of leather manufacturers. This could be due to the government policy of encouraging exports of higher value added finished products as stated in the trade policy documents.

To conclude, an examination of the indicators like output, employment, imports and exports reveals that industries such as chemicals, leather manufacturers, textiles and apparels and clothing registered positive growth rate in the era of liberalization. Considering the share in world exports and the fact that there exists a break in the trend in exports in 1985, the year coinciding with the onset of liberalization policies we conclude that these industries have registered improved performance after the liberalization measures.

Export Competitiveness

Even though there exists lack of unanimity on an appropriate measure of competitiveness there exists no difference of opinion on the fact that there is no single measure which can capture the composite concept of competitiveness. This is evident from the report of the European Management Forum which uses 240 different indicators of competitiveness many of which are quantifiable. It should be noted that the discussion on a nation's competitiveness becomes highly aggregative, only certain sectors, industries or firms can be competitive. Despite the lack of unanimity concerning the concept of competitiveness empirical work on trade flows identify several measures which are quantifiable. These measures are either output based or input based.

To a first approximation, export competitiveness refers to a country's market share in world output. This definition ignores the influences of differing natural growth rates and of distortions arising out of domestic subsidies, taxes or regulations. The frequent reliance on movements in trade balance or on real exchange rates as indicators of a country's competitiveness is avoided in this definition. These indicators provide an erroneous view of a country's or industry's competitive position [Krugman (1994)] raises concern on the use of these indicators. Consider the case of trade balance as an indicator of competitiveness. A redistribution of world resources and production can result in a decline in a country's net exports and even in its share of trade despite an increase in country's absolute output and its share in world production. Real exchange rate measures which frequently rely on consumer price measures, which are not representative of traded goods, too are biased. Belassa (1964) points out the

effect of economic growth in raising consumer price measures relative to traded goods prices, biasing upwards the real exchange rate measures and giving false impression of lost competitiveness in more rapidly growing countries Lipschitz and McDonald (1992) discuss the shortcomings of other real exchange rate measures. It can thus be concluded that a gain (loss) of competitiveness should reflect a gain (loss) in producer's share in both domestic and foreign markets.

Export competitiveness refers to a country's market share in world output.

The fact that both price as well as non-price factors are subsumed in an export share measure of competitiveness is its advantage. The increase in exports can be due to a variety of factors of which our concern is limited to competitiveness alone, which may be in price as well as in non-price factors. Price competitiveness is never a sufficient condition for growth of exports, even though, it is generally necessary for an increase in exports. Competitiveness can improve or deteriorate not solely on the basis of price but on characteristics of the goods themselves, or the after-sales service associated with them. This is clearly brought out in Morris: "Non-price competition may be just as important as price competition in determining the trade success of a particular economy. Attention to product, and the provision of a service can become decisive features rather than the price" (Morris, 1985; esp. p. 481).

The importance of non-price factors in determining the competitiveness of products has been challenged in recent times as noted by Francis and Tharakan (1992). To quote, "If one product is more competitive than another in non-price terms, this means that it is generally recognised that the more competitive product has a better specification, higher quality, more effective marketing and/or more service provided with it than the less competitive product. Presumably the customer can put a price on each of these things ...." (Francis and Tharakan 1992, p. 36). The issue thus boils down to price competitiveness and any revealed measure of competitiveness (viz. market share) needs to be complimented by price indicators.

Evidence on Competitiveness of Indian Industries

In this section we present some indicators which capture the extent of competitiveness of Indian industry. First, an overview of the aggregate manufacturing sector is presented followed by an examination of the export competitiveness of some major commodities of the export basket. We examine two indicators of competitiveness (a) an index of price competitiveness for the period 1980s and (b) Net foreign exchange earned for the period 1990s.

Indicators of export performance like exports as a share of output and export market shares provide an idea of the changes in export competitiveness over time. Manufactured exports as the share of gross output registered a decline from 6.75 per cent in 1976/77 to 3.36 per cent in 1982/83. However, it increased in the mid eighties to five per cent of the gross output of manufacturing sector, coinciding with the liberalization policies. An analysis of export market shares reveal striking results. India's share in world exports was 2.1 per cent in 1950 with 16th position among exporters. Ever since, a steady decline can be observed with India's rank dropping to 47 in 1985. Even among developing countries India's share of manufactured exports declined drastically from 22.1 per cent in 1962 to 11 per cent in 1970. A further decline was observed in 1980s from 4.4 per cent in 1980 to 3.4 per cent in 1985 and remained steady at 3.4 per cent in 1990. It is however argued that this poor export performance is due to the pull of the domestic market as exports are often the residual of domestic demand. Virmani (1991) provides evidence to argue that an increase in domestic demand leads to decline in the growth of manufacturing exports.

Another popular measure used in the comparison of export competitiveness is the growth in unit labour costs. The argument behind the use of this measure being, an increase in labour costs will increase the unit costs, as industrial prices are cost determined this results in a higher prices leading to a reduction in domestic as well as overseas market shares. Table 3 compares the growth rate of real product wage in India with some of the industrialised countries. It is evident that the growth in real product wage is the highest in India in 1980s.

Table 3: Annual Growth rate in Real Product Wage (1979-1989)

Country	Growth rate in RPW
Australia	0.4
Belgium	1.2
Canada	1.2
Germany	0.8
Italy	0.7
Japan	2.1
USA	0.6
India	3.9

Source: Applebaum and Schettkat (1995).

Note: (1) Product wage is defined as annual emoluments per employee deflated by price index for manufacturing.
(2) For India 1982/83 to 1988/89.

It should be noted that an analysis of labour productivity along with the labour costs provides a clearer picture. In Table 4 are presented the growth rate of exports and value added per worker of some of the developing countries. We find that both the growth of value added per worker and exports are the lowest in India.

Table 4: Growth of Manufactured Exports and Value Added per Worker

(1970-1990)

Country	Exports (1970-91)	VA per worker (1970-90)
Korea	18.44	5.71
China	9.9	4.5
Pakistan	4.39	4.19
Uruguay	7.69	3.88
Thailand	21.15	3.09
Mexico	10.46	2.96
Singapore	16.38	2.58
Barbados	10.54	2.2
India	5.62	2.12

Source: Cooper (1995).

Fagerberg (1998) argues that comparisons of international competitiveness on the basis of unit labour costs are too simplified. According to him the main factors influencing differences in international competitiveness and growth across countries are technological competitiveness and the ability to compete on delivery. He points out the crucial role played by investments in creating new production capacity. In this context it will be worthwhile to look into the technical efforts in Indian manufacturing industry in the 80s.

Table 5 lists R&D expenditure along with actual foreign technology payments (not approved). The intensity in the use of new foreign technology collaborations (FTC) and foreign technology payments in relation to manufacturing value added have increased in the 80s. Also a sharp rise in the investments in foreign disembodied technology can be seen in Indian industry in the 80s. In other words FTC dominate as the source of technology. This is brought out in column 8 which shows that foreign technology payments was nearly as large as R&D in some years.

In this context international comparisons of R&D activities becomes relevant. As seen from Table 6 India's investment in R&D, receipts of patents, and the ability of the firms to procure and adopt technology is relatively low compared to other countries. A major reason for this lagging behind in technology up-gradation is the insignificant contribution of private sector toward research and development. This is evident from the fact that nearly 88 per cent of the funding for R&D is provided by the State where as in Japan it is only 21 per cent in 1988. The Table shows that India lags behind in the generation of knowledge and its conversion to commercially viable activities.

Other measures of competitiveness like the nominal and effective rates of protection (ERP) and domestic resource costs (DRC) has been examined in a number of studies in the Indian context – Kathuria (1995) is of the view that ERP and DRC analyses are useful only in judging the efficiency per se of sector. According to him "The rather surprising conclusion that emerges from such studies is that majority of Indian industries are efficient converters of inputs to output. One reason as to why this is not translated into a substantial share of world market for manufacturers is that in looking at international competitiveness it is ultimately price comparisons (NPC) that are relevant. For example, an industry could have an efficient ERP/DRC but still be non-competitive in terms of price owing to high input prices" (Kathuria 1995:163). Thus examining the cost structure and factor productivity becomes crucial (McGheen, 1968) for a better understanding of competitiveness.

The following empirical procedure is followed to calculate price competitiveness. First, we arrive at the unit value of India's exports of the commodities chosen. These unit values are compared with those of the competing countries. The competing countries are defined as the top ten exporters of the commodity considered. A weighted unit value index is constructed for the competitors with the weights being arrived from the market shares. Thus we define index of price competitiveness as:

$$\text{Index of price competitiveness of India's exports} = \frac{\text{Unit value index for competitors}}{\text{Unit value index for India}}$$

A rise in index from the base period may be interpreted a rise in price competitiveness of the product.

The commodities chosen for this exercise and the corresponding SITC codes are:

Synt. Dyes, NAT Indigo lakes (531), Synthetic organic Dye stuffs (5311) Pigments paints etc. (533) Leather Bovine (6114), Cotton Yarn (6513), Grey Woven Cotton Fabric (6521), Carpets etc., knotted (6592), Men's Outwear, not knit (842) Women's Outer wear, not knit (843), Under garments, not knit (844), Outer wear, knit, nonelastic (845), Under garments, knitted (846). These items of export were chosen from the three major

Table 5: R&D in Manufacturing sector

(10 million Rs and percentages)

Year	R&D (1)	FTP* (2)	(1)+(2) (3)	MVA (4)	(1)/(4) (5)	(2)/(4) (6)	(3)/(4) (7)	(2)/(1) (8)
1980-81	207.1	113.8	321.7	22143.0	0.93	0.51	1.45	0.55
1981-82	254.6	286.7	542.3	25952.0	0.98	1.10	2.08	1.13
1982-83	319.4	298.3	618.8	28904.0	1.10	1.03	2.13	0.93
1983-84	369.5	342.5	713.1	34001.0	1.01	1.00	2.01	0.93
1984-85	382.1	329.1	711.2	38334.0	0.99	0.86	1.85	0.86
1985-86	426.0	391.4	817.4	43113.0	0.99	0.91	1.86	0.92
1986-87	555.2	398.5	953.7	47756.0	1.16	0.83	2.00	0.72
1987-88	598.7	529.3	1128.0	54744.0	1.09	0.97	2.06	0.88
1988-89	759.7	584.0	1343.7	64688.0	1.17	0.90	2.07	0.77

Source: Jacobsson & Alam (1994).

Note: * Foreign technology payments. Until 1988-89 actual figures and for last three years approved

Table 6: International Comparison of R&D

Country	Tot. R&D Expen (as % of GDP)	Business Expen on R&D (as % of Tot. Exp.)	Public funding of Tot. R&D#	Patents@	Search Technology$
India	0.909	13.05	88.07	0.06	50.18
Brazil	0.381	19.8	66.87	0.32	45.43
Thailand	0.342	13.85	69.57	0.02	61.00
Korea	1.631	29.61	19.00	1.12	53.57
Canada	1.316	55.74	43.00	4.98	51.15
USA	2.658	70.33	45.88	16.72	62.71
Japan	2.852	66.02	21.46	40.52	85.85
Germany	2.791	74.18	37.66	24.42	68.61
France	2.308	59.77	59.39	16.68	63.28
Netherlands	2.321	59.33	41.74	5.14	59.09

Source: Prakash Chandra and P.R. Shukla (1994)

Notes: # Percent of total funding provided by state, 1988

@ Average number of patents granted by residents per 100000 inhabitants, 1985-1987

$ Efficiency of companies in seeking new technologies and commercially exploiting them. 0 = inefficient, to 100 = efficient

industries viz., chemicals, leather and leather manufacturers, textiles, apparels and clothing which as mentioned earlier showed improvements in the indicators chosen for an assessment of the reforms. The data was drawn from the United Nations Yearbook of International Trade Statistics with all values in US dollars. The findings are illustrated in Figs. 1-3.

Given the self-explanatory nature of these figures our explanations are brief. First of all, in the first phase of liberalization, price competitiveness has improved only in six out of the twelve industries chosen. They are: Synt. Dyes, NAT Indigo lakes, Pigments paints etc., Cotton Yarn, Men's Outer wear, not knit (...) and Outer wear (knit non-elastic). While in industries like Synthetic organic Dye stuffs, Leather Bovine, Grey Woven Cotton Fabric, Carpets etc. (...) knotted(...), Women's Outer wear, not knit, Under garments not knit and Under garments knitted, price competitiveness has worsened. Most of the traditional export items like Leather Bovine and Grey Woven Cotton Fabric have been hit hard by the liberalization measures. A review of the policies clearly reveal that the thrust areas of exports have been shifted to items like chemicals and higher value added items in textiles such as knitted wears. The measures of import

duty concessions for the material inputs and granting export concessions have enabled to lower the cost of production in items like chemicals. However, the improvement in price competitiveness in the case of cotton yarn, men's outer wear, not knit, and outer wear, knit non-elastic have not been translated into market shares. Considerations of quality and product differentiation seem to be more important in these commodities.

Table 7: Annual growth of Total Factor Productivity (1970-85)

Country	TFPG (%)
Hong Kong	2.5
Thailand	1.9
Italy	1.8
Taiwan	1.5
Korea	1.4
Japan	1.2
UK	0.9
Germany	0.9
Brazil	1.0
USA	0.4
India	0.1

Source: Young (1994)

Worsening of price competitiveness in six out of the twelve industries sheds some light on the nature of the trade liberalization policies of eighties. These policies have not percolated down to the firm level to reduce the costs or to increase the productivity. This has prevented in imparting price competitiveness to the export items questioning the wisdom of the use of these across the board policies. Notwithstanding these considerations the policy makers pursued trade liberalization more vigorously in the post 1991 period.

Worsening of price competitiveness in six out of the twelve industries sheds some light on the nature of the trade liberalization policies of eighties.

A major villain of the 1991 crisis was the lack of foreign exchange. India's foreign exchange reserves position was precariously poised in 1991 plunging the economy into a crisis, forcing to alter the economic policies further. The strategy was thus to earn more foreign exchange to finance our imports. Two routes were identified for this, (a) welcome more foreign investments through more liberal policies regarding foreign direct investments and foreign portfolio investments and (b) vigorously promote exports. As an assessment of the first strategy lies beyond the purview of this paper we confine to the second only.

As any increase in exports or market share in world exports should ultimately result in more foreign exchange earnings when one considers the average foreign exchange earned by the exporting firms in these industrial groups. Using data on exporting firms drawn from the CMIE's electronic medium 'Prowess' we compute the average net foreign exchange earned by the firms for the period 1991 to 1997. Net foreign exchange earned is defined as foreign exchange earnings in F.O.B. prices minus foreign exchange spendings at C.I.F. prices with both values in millions of dollars. It should be noted that foreign exchange spendings include amount spent on

Table 8: Average Net Foreign Exchange Earned by the Exporting Firms

	1991	1992	1993	1994	1995	1996
Inorganic Chemicals	-202	-0.82	-0.77	-0.28	-0.25	-0.78
Organic Chemicals	-1.03	-0.61	-0.94	-0.64	-0.41	-0.66
Dyes & Pigments	3.38	3.57	3.23	2.80	2.76	2.72
Drugs & Pharma.	-0.49	-0.48	-0.55	0.01	-0.10	0.13
Cotton & Blended yarn	1.03	1.79	1.06	1.15	1.37	1.95
Ready made garments	3.18	4.17	1.52	2.00	1.64	1.83
Food & Beverages	1.93	2.16	1.75	1.60	1.31	1.33
Gems & Jewellery	5.69	6.47	3.80	4.75	3.27	3.75
Non-ele. Machinery	-1.56	-1.12	-0.95	-0.98	-1.05	-1.42
Ele. Machinery	-7.01	-2.25	-2.55	-1.50	-2.90	-4.22
Electronics	-5.44	-4.19	-3.06	-1.90	-1.87	-2.70
Iron & Steel	-7.31	-6.51	-3.56	-1.63	-3.60	-4.85
Leather pdts.	1.67	2.78	1.27	2.51	1.48	3.01

Source: CMIE, Prowess.

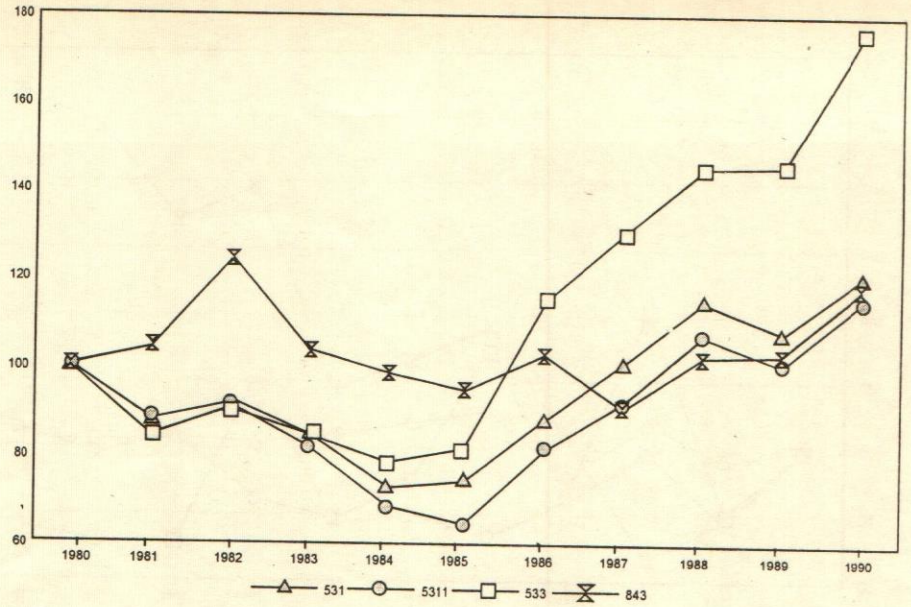

Fig. 1. Price Competitiveness

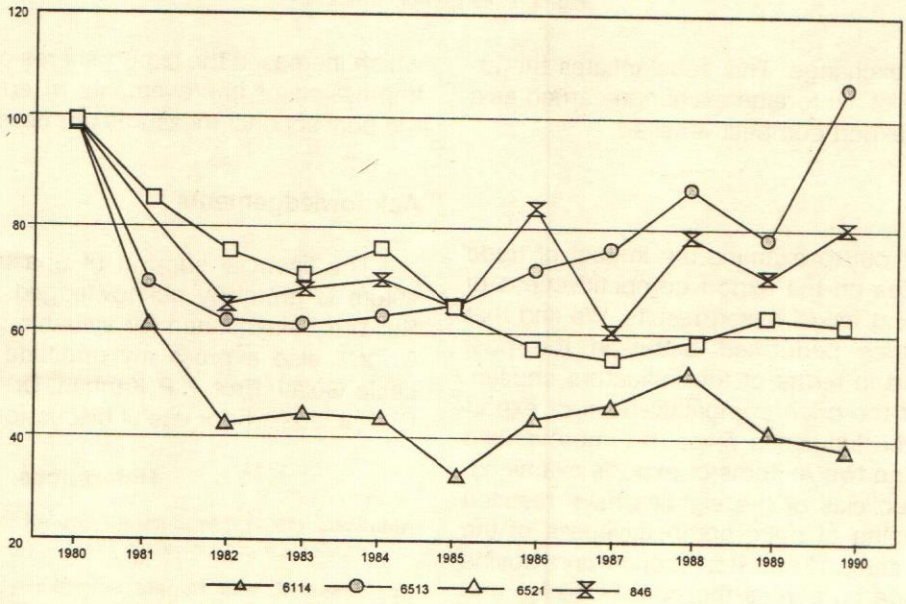

Fig. 2. Price Competitiveness

the purchase of raw materials, capital goods, royalties, technical know-how fees, interest remittances, dividend and others. This belief to be a better measure, unlike market shares, as it unmasks the outflow of foreign exchange which assumes relevance in the analysis of more open economies. The results are presented in Table 8.

It is striking from the table that six out of the thirteen industries chosen are negative foreign exchange earners, i.e., spendings are more than the earnings, consistently through out the period. This is all the more important as these industries had registered increased growth in exports in the nineties. Dyes, pigments and paints is the only industry which maintained a consistent foreign exchange earnings. In three industries, drugs, cotton and leather products, foreign exchange earnings increased. Export items like ready made garments and gems and jewellery in which the market shares have increased in the nineties have witnessed decline in foreign exchange earning in recent years. This is due to the fact that firms in order to boost exports very often enter into foreign collaborations or acquire expensive foreign technology which leads to outflow of foreign exchange through dividends and royalties and technical know-how fees. Access to foreign credit market and easy imports of capital goods have also increased the

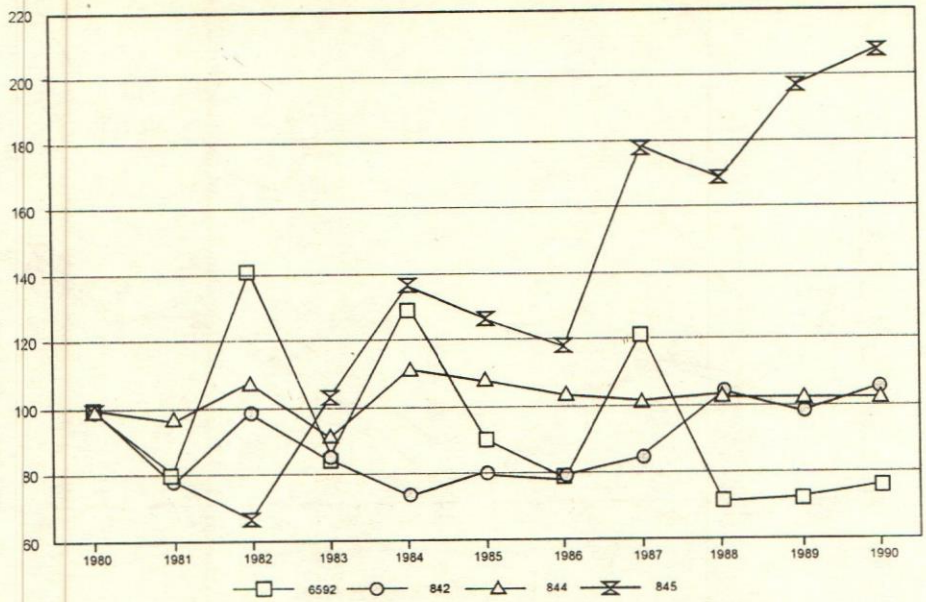

Fig. 3. Price Competitiveness

outflow of foreign exchange. This substantiates the argument for the use of net foreign exchange earned as a better indicator of export competitiveness.

Conclusions

This paper set out to examine the impact of trade liberalization policies on the export competitiveness of Indian manufacturing reveal mixed results. We find that only three industries performed better in the post liberalization period in terms of the indicators chosen. An examination of the price competitiveness of export items of these three industries reveal an improvement only in six out of the twelve items of exports examined. The liberal trade policies of the eighties have resulted only in the worsening of price competitiveness of the traditional export items like cotton fabrics and bovine leather. The reliance on across the board policies and tinkering of the exchange rate, rather than industry specific or sector specific policies have resulted only in an upward revision of prices compared to that of the competitors. These incremental doses of liberalization policies have failed to impart even price competitiveness to most of the export items considered for the study. As export competitiveness of more open economies is better portrayed by the net foreign exchange earned by the exporters. An analysis of the reforms in the nineties based on this, indicate that the export competitiveness has worsened. The more liberal policies have resulted in easy tie ups with foreign firms and acquisition of foreign technology and import of capital goods leading to an excess of foreign exchange outflow over earnings. This is pertinent to the industries, which increased the export shares conveying the wrong impression of improvements in competitiveness when the conventional measures are used.

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Obtaining Efficiency in India's Capital Markets

Ajay Shah

Capital markets are essential prime mover of economic growth of a modern economy for they shape the 'price of time' and the 'price of risk' the investment projects face. The author of the paper examines these factors in the light of Indian economy and it is widely recognized that inefficiencies in the financial system can lead to 'incorrect' pricing of time or risk. The fragility of Indian banking system today poses a threat to macro economic stability in the country. In this context the important role of securities markets in the economy is stressed.

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Introduction

Capital markets are a vital driver of economic growth in the modern economy. Capital markets perform two fundamental roles in the economy: they shape the *price of time* and the *price of risk* that investment projects face. Every investment project consists of exchanging some initial project costs for risky returns at future dates. Capital markets determine the cost of capital that each project must suffer, based on the time profile of returns, and the risk profile.

Capital markets determine the cost of capital that each project must suffer, based on the time profile of returns, and the risk profile.

India is a country where capital is scarce. Hence, the cost of capital will always be higher in India as compared with that seen outside India; this is one major motivation for greater openness to international capital markets. The interest rate for a 30-year loan in Japan is 2 per cent (in yen), and a 30-year debt market in India does not exist. Hence it makes a lot of sense if long-term projects in India can borrow in Japan.

At the same time, the skills and efficiency that are seen in India's financial sector can have a major impact upon the domestic economy. Inefficiencies in India's financial system raise the cost of capital, and can disable access to capital for certain kinds of risky projects. Inefficiencies in India's financial system can lead to "incorrect" pricing of time or risk; this can lead to funds being channeled to inappropriate projects, thus generating inferior economic growth.

In the aftermath of the East Asian Crisis, it is now

widely recognised that when the financial sector is weak at information processing, and channels capital unwisely, it can have major macro-economic ramifications. The fragility of India's banking system is, today, an important threat to macro-stability in India in the years to come. These concerns lead to a fresh focus upon improving market efficiency and prudential regulation in India.

The Role of Securities Markets

In order to better evaluate policy issues in the securities markets, it is useful to take stock of the functions which securities markets perform in the economy.[1]

The Allocative Function

One of the basic problems in the economy is to link up households, who have savings, with companies, who seek to build factories. How will the savings be allocated? There are always thousands of companies which would like to obtain funds for their expansion projects. Which companies should get the funds? The supply of savings is fixed, so when one factory is built, it comes at the cost of other factories which cannot be built.

The financial system is the method of translating savings into growth. The financial sector allocates savings into projects. When the financial sector performs its tasks well, we obtain good growth.

Earlier, in India, the choice of the companies which should get funds were highly influenced by government and government-owned banks. This was vulnerable to political influences and poor analysis of projects by public-sector banks, and often led to resources being misallocated. Most economists felt that the (low) economic growth which which one gets in India was not commensurate with the (moderate) savings rate[2].

Financial markets serve to guide the flow of capital in the modern economy, choosing the companies and industries which should get funds for expansion, and those which should not. Financial markets also enable the vital function of the takeover market, whereby promoters can be unseated from control of companies which they are doing a poor job of running. When the assets and staff of a company go to better hands, economic growth is enhanced. Consequently, financial sector reforms are hence of great importance. If the financial sector can function better, one would obtain higher growth in the economy even at the existing savings rate.

Financial markets serve to guide the flow of capital in the modern economy, choosing the companies and industries which should get funds for expansion, and those which should not.

Risk Transfer Function

The second major function of securities markets is to remove risk (Mason 1995). Herein, the concept of share ownership makes a major difference to this scenario. Instead of one person bearing the entire risk of the project, the risk can be shared across numerous people in the economy. Each person makes a choice of the risks that he is willing to bear. Individuals who are willing to bear more risk buy shares, and earn higher returns. Individuals who wish to avoid risk do not buy shares, and earn lower returns. In addition, the risk that each shareholder needs to suffer from his participation in one company can be quite miniscule. When a person buys 1000 shares of a major company in India, he owns less than 0.0001 per cent of the company. This is a level of risk that many people are comfortable with.

Securities markets also enable risk reduction by diversification. If one person invests all his wealth into one company, he is dangerously exposed to the fortunes of that company. When households build portfolios of many securities, they benefit by not putting all their eggs into one basket.

Another, avenue for risk transfer is based on derivatives markets. Derivatives are a direct method for removing or adopting the major risks of the economy. Reforms in the derivatives markets is one of the major tasks on the agenda for financial sector reforms today.

Reforms in Securities Markets

The central role for government in the securities markets is to foster the development of liquid and efficient markets. They are:

- Liquidity pertains to the costs that are faced in doing transactions on the secondary market. A highly liquid market is one where transactions are inexpensive. An illiquid market is one which imposes onerous costs upon people who trade on the market.

1. For an elegant treatment of the functions of the financial sector, see Crane, Merton, Froot, Bodie, Mason, Sirri, Perold & Tufano (1995).

2. For a treatment of banks and markets in India's financial system, see Shah & Thomas (1997) and Shah (1999).

- Efficiency pertains to extent to which secondary market price of a security reflect high quality information and analysis about the future risk and return of returns on the security. An efficient market is one where prices are "fair". More risky securities cost less, and offer higher future returns. Less risky securities cost more, and offer lower future returns.

This focus on the twin objectives of liquidity and market efficiency applies equally to the five major financial markets of the economy – equity, debt, foreign exchange, commodities and real estate. This focus also helps us understand what government should not be attempting to do on financial markets. The most important thing that government should not do on financial markets is influence prices. The determination of prices is something which markets do well by themselves. Government should not try to manipulate markets to push prices up or down. As long as a market is liquid and efficient, the market price is generally more meaningful than the views of economists or bureaucrats about what the price "ought" to be.

This focus on the twin objectives of liquidity and market efficiency applies equally to the five major financial markets of the economy – equity, debt, foreign exchange, commodities and real estate.

The Primary Market

Market offerings can either take place for the first time (the initial public offering, the "IPO") or additional shares of existing listed stocks can be sold (the seasoned equity offering, the "SEO"). IPOs are fraught with asymmetric information and uncertainity – buyers do not know the true worth of the shares and sellers know more about the company than buyers.

The ideal primary market is one that gives "fair" prices to projects. Hence, if a project is a scam, it should only be able to get a very poor valuation from the market. A good project should be able to command a high valuation from the market.

In India's primary market, there has been a great focus upon situations where investors have lost money, in scandals such as M.S. Shoes. These situations are failures of the primary market in the sense that the prices awarded for securities on the primary market were well above the fair valuation of these securities.

The primary market today is one where scamsters obtain valuations which are too high and good projects detain too low values. If we calculate a weighted average of outcomes from the primary market, they reflect an acute under-pricing, where companies are forced to sell shares at values which are "too low" compared to a fair risk return evaluation. This might appear unusual to many, who are used to observing newspapers emphasise the scams where investors have lost money. Yet, a fuller examination reveals that the overall average exhibits under-pricing rather than over-pricing (Shah 1995).

India's primary market hence beckons scamsters, who stand to gain valuations which are above the fair value, and dissuades good projects, who face the prospects of getting an unfairly low price. This state of affairs will perpetuate itself unless radical changes are made to the issue process.

The central problem with the existing issue process is two-fold: (a) public issues come to the market with a fixed price, and (b) there are ponderous delays between the date that the price is fixed and the secondary market trading of the new listing commences. These two factors lead to the peculiar combination of scams and under-pricing that is mentioned above. Policy makers should seek ways to (a) avoid fixed-price offerings (Benvensite & Wilhelm 1997) and (b) eliminate the delays.

Instead of a fixed price offering, a public issue should come to the market with a prospectus but no stated offer price. The shares should be auctioned over a computer network such as that of NSE. Depending upon the judgment of investors across the country, the market will "discover" a fair price for the issue. This is a more effective method of obtaining accurate prices, instead of merchant bankers and issuers setting an offer price.

In addition, the issue process should be structured so that the auction takes place on a Friday, the shares are issued over the weekend in the depository, and trading commences on Monday. This would eliminate the uncertainties which are caused by the long delays in the issue process. This would also sharply cut down the costs incurred by companies when doing public issues.

These two initiatives – price formation over a computer network, and immediate listing – will substantially remove the problems of India's primary market, and hence improve the allocative capabilities of India's finan-

cial markets. It should be possible to initiate public issues in such a framework within six months.

PSU Disinvestment

There are two aspects to the problem of selling PSU shares: the inherent concerning the price and mechanism through which shares are sold, and problems of the political and administrative process which generates sustained PSU disinvestment. We focus on the first question, where there is considerable value in applying well-understood principles of financial economies.

Once a share is listed and highly liquid, the secondary market price is known, and serves as a powerful signal about the true value. Selling additional shares at a price close to this price, in an SEO, is not hard. State Bank falls in this category; it is one of the most liquid securities in India today and selling additional shares at a price near Rs. 225.70 (the NSE price on the 24th of March) should not be hard. Hence, if revenues are desired with rapidity, at the minimum complexity, then SEOs of existing liquid stocks should be used.

The best SEO mechanism is likely to be the following: Government should announce a calender for sales through the year, wherein 0.5 per cent of SBI will be sold (using a market order) at the NSE pre-opening (uniform price) auction on the first Wednesday of every month for the next 12 months. This implies selling 6 per cent of SBI per year. Institutions will obviously participate in such an auction of their own volition, but a great mass of retail traders can also do so. The 5,000 NSE terminals (using 2,000 satellite dishes) make a large distribution system for attracting retail investors, and we should never forget that retail investors account for over 95 per cent of stock market trading in India.

In this faction, 6 per cent of every liquid PSU can be sold off per year without serious problems or a complex process. The gradual sale process eliminates the risk of getting unusually good or unusually bad prices that may prevail at any point in time. The use of existing facilities at NSE drops the issue cost to 0. By linking up the government with the ultimate buyers, it eliminates intermediation costs.

How should IPOs take place? The best IPO mechanism consists of a uniform-price auction with the widest possible distribution in the country. "Bookbuilding" is an IPO mechanism that only reaches institutions; it would generally yield an inferior price by virtue of keeping individuals out

While one can enter into a discussion on how best to do the IPO, we should appreciate that in the best of times, the IPO process is intrinsically hard, and yields underpricing (poor IPO mechanisms generate greater underpricing). Underpricing levels like 10 per cent are common in the best IPO procedures, such as the auctions used in European IPOs.

What is the role of foreign investors and offshore issues? Given the poor levels of international diversification prevalent globally, a foreign investor always values a share above a local investor. This is based on the gains from diversification. An Indian investor places a higher value on Singapore Airlines than a Singapore citizen, and a Singapore citizen places a greater value on Air India than an Indian. Hence greater flexibility to foreign investors yields higher share prices in India, and higher SEO proceeds.

Offshore issues have been a response to two problems: (a) poor Indian securities markets and (b) restrictions on share ownership placed by India. The first problem was important till 1994, but with the advent of NSE, NSCC and NSDL, and with improvements in trading at BSE, there is no advantage in offshore issues; in fact the GDR market is more liquid than NSE on only one issue (VSNL). Today, the only reason for an offshore issue is when the 24/30 constraint on FII ownership is reached. We should (a) ensure that each PSU passes a shareholder resolution moving the limit from 24 to 30, and (b) modify this policy to change the 24/30 limits to 49/100.

Summary

1. If proceeds are desired with the least complexity and delay, then shares of existing liquid PSUs, such as SBI, should be sold in SEOs. The best way to achieve this is to place 0.5 per cent of the company into the NSE pre-opening auction each month using a pre-announced calendar.
2. It should be understood that the IPO process is hard. We can consider auctions and bookbuilding, but an excellent alternative is to mix political objectives into the IPO process. 20 per cent of the PSU going IPO should be sold at "a low price" so as to maximise widespread retail participation. This would build a constituency for PSU disinvestment and profitable PSUs. It would energise secondary market liquidity, yielding a reliable price, and pave the way for high revenue SEOs.
3. The greater the flexibility given to foreign investors, the greater the valuation of Indian stocks.

PSUs should immediately pass resolutions allowing FII holdings till 30 per cent, and government should move the 24/30 limits to 49/100.

4. GDRs are attractive in so far as they bypass the 24/30 limit,but in all other respects they are now unattractive. If the 24/30 limit is not binding, or if it can be changed, there is no reason to use the GDRs today.

5. The issue mechanisms at IPOs should favour broad-based retail participation and transparency—such as an anonymous auction conducted on 5,000 NSE terminals—rather than closed-door sales in a small club of institutions.

The Secondary Market for Equity

There are two major issues which need to be dealt with on the secondary market for equity: adoption of the depository, and transition to rolling settlement.

Adoption of the Depository

When people trade on the secondary market, they often need to do settlement, where the buyer brings money and the seller brings shares. This proves to be a very costly process in India, where securities are kept on paper certificates. For small investors, the costs and risks involved in paper certificates are large—these include certificates lost in post, destroyed in handling, stolen certificates, counterfeit certificates, signature mismatches, etc.

The depository is an institution which keeps track of the owners of securities in a computer database. If shares need to be transferred from the name of one person to another, then that is merely done by changing the title of the shares in the computer at the depository. This is much cheaper than the process of changing ownership of physical certificates, and much less prone to criminal activities.

The depository is an institution which keeps track of the owners of securities in a computer database.

India's first depository, the National Securities Depository Ltd. (NSDL) was inaugurated in November 1996. In the following months, depository adoption has proceeded at a hectic pace.

The role for public policy is to shorten the period of time over which trading on India's secondary market becomes completely based on the depository. Even without specific attention from policy makers, the adoption of the depository will take place, the only question is that of pace. The challenge that we face is to rapidly phase out the use of physical certificates Policy makers can employ a variety of incentives and compulsion in coaxing India's investors into complete adoption of the depository.

SEBI has strongly supported depository adoption, to a point where one third of settlements in India are now done through the depository. It is now possible to have a scenario within one year where this figure rises to 100 per cent. This can be achieved by rapidly growing the list of securities where institutions and retail investors have to mandatorily settle trades in electronic form.

Transition to Rolling Settlement

One peculiarity that is relatively unique to India's stock markets is the use of "weekly settlement", whereby trades take place for a week and then the open positions that are left at the end of the week are settled using shares and money. On NSE, the weekly cycle runs from the Wednesday to Tuesday. On BSE, the weekly cycle runs from Monday to Friday. This kind of settlement is called "futures-style settlement" owing to the strong similarity with the functioning of futures markets.

Many of the problems of India's secondary market can be traced to this peculiar style of settlement. A superior alternative which is used worldwide (except France) is called rolling settlement". Rolling settlement relies on settlement a few days after a trading day. Suppose we do settlement 5 working days after the day of a trade. Then this is called T+5 rolling settlement, to convey that the settlement takes place five working days after the date 'T' on which a trade takes place.

With T+5 settlement, positions can be reversed inside the trading day. But at the end of the day, all open positions turn into delivery and payment five days hence. Hence, a person who sells shares on Monday would get the money next Monday, a person who sells shares on Tuesday would get the money next Tuesday, etc. This is remarkably attractive from the viewpoint of an investor, who can quickly and reliably convert securities into funds and vice versa.

There are four major institutional arrangements which serve to pave the way for rolling settlement:

(i) Facilities for borrowing shares,

(ii) Equity derivatives markets,

(iii) Large-scale adoption of depository,

(iv) Facilities for borrowing money.

In February 1999, NSE created a publicly accessible mechanism for borrowing shares: hence the first requirement is now met. The adoption of the depository is nearly complete for the 50 most important stocks in India, i.e. the members of the NSE-50 index. Equity derivatives trading can commence within a matter of weeks (see Section 6). Facilities for borrowing money against shares as collateral, especially using dematerialised shares, are well in place. Hence, the four pre-requisites for the migration to rolling settlement are now fulfilled, and we can make the transition into rolling settlement.

This can be done as follows. SEBI should announce that all trading for the NSE-50 stocks should only take place with T+5 rolling settlement from June 1999 onwards. After this, it would be easy to enlarge the universe of stocks to cover all stocks in India; however the NSE-50 stocks account for 75 per cent of the trading volume and dominate the stock market. The international minimum standard, today, is T+3 settlement, while discussions in India have focused upon the slower T+5 settlement. However, it is common for markets to begin with T+5 and gradually go down towards T+3 and then to T+2 and T+1.

The Debt Market

Experience in the equity market, with the reforms from 1993 onwards, has thrown up three major lessons about how trading should take place:

(a) Trading should be anonymous; the buyer and seller should not know each others' identities.

(b) A computer system should show all prices and unmatched orders.

(c) A clearing corporation should become the legal counter-party to both legs of every trade.

These ideas underlie a market like NSE, which has transformed equity trading in India. In contrast, the debt market has not made serious progress in terms of obtaining liquidity and market efficiency. The time has now arrived to apply these same ideas for trading on government securities. The market for government securities today violates each of these principles—identities are known, trades are struck over telephone instead of computerised order matching, and there is no clearing corporation.

If these principles are applied to the government securities market, they will yield much better liquidity and market efficiency on the debt market. An active debt market will reveal interest rates to the economy, it will improve the ability of the RBI to adjust money supply by trading on the market, and it will pave the way for further development of the banking system. These reforms are implementable within a period of six months.

An amendment to the Securities Contract Regulation Act, which clarifies the jurisdiction of the RBI vis-a-vis SEBI on questions connected with the debt market, has recently been cleared in Parliament. This paves the way for RBI to clarify its vision about the future of the debt market.

Derivatives Markets

These are financial agreements which are "derived" from an underlying spot market. Derivatives include instruments such as forwards, futures, options, swaps, etc. Derivative markets are called "markets for risk", where people buy and sell risk, as opposed to conventional spot markets where people buy and sell goods. Derivative markets once flourished in India—the BSE was considered a highly successful options market in the late nineteenth century—but were suppressed by government in the 1960s. When this happened, some of the markets died, and others went underground, where they continue to flourish.

The simplest example of a derivative is a forward contract. Importers who expect to require dollars in the future are at risk from movements in the exchange rate. If an importer enters into a contract to buy dollars on a future date, at a price fixed today, this risk is eliminated. Such trades are done on a forward market. The largest derivative market which exists today in India is the dollar-rupee forward market, which does daily trading volumes in excess of Rs. 5,000 crore.

When a forward market is formally institutionalised at an exchange, it is called a future market. This improves the functioning of the market in terms of liquidity, and regulatory supervision. Many futures markets exist in the country for trading in commodities.

The extension of derivative markets in the country is one of the most important areas of progress for the financial sector. The existing dollar-rupee forward market would function better as a dollar-rupee futures market. The existing commodity futures exchanges are in need of a major enhancement in their quality of operations.

On the equity market, NSE has developed computer systems required to run a market for futures and options on the NSE-50 stock market index. NSE had essentially finished the developmental work towards this market by 1996. Since then, the regulatory process has held up the actual start of trading. From 1996 onwards, a fresh set of hurdles has come up in each few months for the commencement of derivatives trading. Recently, Parliament cleared an amendment to the Securities Contract Regulation Act. Right now, the immediate hurdle is the date on which SEBI clears the proposal which NSE had submitted to SEBI in 1996.

The sequence of events following 1996 is a poor reflection upon the policy making process in India's financial system; we have had an entity (NSE) develop a new technology (derivatives), which has been prevented from introducing this new technology on the Indian market ever since. This sensitivity to pressure groups and special interest factions is out of place. It is in sharp contrast with the goals of financial sector regulation and policy, which should be to promote innovation and speed up the conversion of new ideas into normal market practice.

Derivatives offer enormous possibilities for individuals and companies in India to better manage risk: reducing their risk when desired, and adopting enhanced risks when desired. The development of derivatives markets in one of the most important items on the agenda for financial sector reforms (Waghmare 1997, Thomas 1998). If policy makers act effectively, then a strong and healthy set of derivatives markets can be created within three months.

Access to Information

Our treatment of liquidity and market efficiency so far has emphasised market mechanisms, with an eye to modifying market mechanisms in a way that would enhance liquidity and market efficiency.

There is another vehicle for obtaining improved market efficiency and liquidity in an economy: good quality information disclosure. In a world where companies produce reliable, good quality information, and that information in released in a symmetric manner to investors all over the country, it would serve to improve both liquidity and market efficiency. Hence an emphasis on improved disclosure would yield low-cost improvements in market quality in India.

Two committees (Dave 1997, Bhave 1997) have recently explored the issues involved in disclosure, and produced a detailed road-map for how these reforms should proceed. Some policy initiatives which are universally recommended are (a) the release of full audited accounting results (both balance sheet and profit & loss) every quarter, (b) disclosure of results by product line, and (c) disclosure of group accounts. It should be possible for government to substantially overhaul standards for disclosure in India within three months.

Conclusions

There are two aspects of financial sector reforms which are remarkable:

(a) The importance of the financial sector, which can almost be thought of as "the planning commission" of the Indian economy of the 1990s.

(b) The ease and speed with which all the ideas mentioned in this chapter can be implemented. The special interest groups who would be hurt by these reforms are fairly small and unimportant. The reforms proposed here are not multi-year affairs – the longest time horizon offered is six months.

Hence, reforms to the securities markets are an area where the political cost is small when compared with the economic benefits.

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The Political Economy of Globalization

V. Upadhyay

Globalization is transforming the world at a breathtaking pace. The phenomenal growth in international trade in recent past indicates rapid economic integration at the global level. The expansion in Foreign Direct Investment (FDI) has been even more dramatic than in international trade, especially since the early 1980s. The globalization process is having profound impact on the way our economic life is organised. In the present era, it is claimed that greater part of economic life is determined by global processes which leaves no room for national economies, no room for domestic strategies of national economic development. The implications of the globalization process for developed countries and developing countries are however not similar. In this paper we wish to examine the nature of the present globalization trend, its logic and its effects and discuss what role can developing countries play in reforming international monetary system.

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Introduction

Globalization is transforming the world at a breathtaking pace. The phenomenal growth in international trade and capital flows across national boundaries in recent past indicates rapid economic integration at the global level. The process of globalization has even put the traditional roles of the nation-state under question mark. The implications of the globalization process for developed countries and developing countries are however not similar. In the present paper the nature of the present globalization trend, its logic and its effects and discuss what role can developing countries play in reforming international monetary system are examined.

Globalization can be defined in a positive sense as a process of increasing openness, growing economic interdependence and deepening economic integration between countries in the world economy. The question one needs to ask here is whether can this process be described as totally new or overwhelming. But the word globalization is sometimes used in a normative sense to prescribe a strategy of development based on a rapid integration with the world economy (Nayyar, 1997, pp. 13-14). It is this normative use of the term which has given rise to considerable debate on the subject. For some, the process of globalization is a sure path to prosperity; while for others, its possible harmful effects far outweigh its positive effects.

Globalization can be defined in a positive sense as a process of increasing openness, growing economic interdependence and deepening economic integration between countries in the world economy.

Global Integration

The mainstream case for openness rests on the

belief that free trade enhances welfare. It is argued that free trade results in a more efficient international division of labour as nations are forced to specialize in the production of goods and services in which they have a comparative advantage. Mainstream economics admits that it is possible that some people may suffer as a result of free trade. Trade liberalization could prove ruinous to some firms which are not able to withstand import competition.

International trade theory predicts convergence of factor prices and goods prices as a result of trade and competition. The neoclassical factor price equalization theorem states that interest rates, profit rates, wages, prices and incomes will converge due to mobility of factors of production and the mobility of goods and services. The Stopler-Samuelson theorem predicts convergence even in the case when factors are immobile. Wages and incomes converge since (immobile) capital and labour are incorporated in mobile goods (see Unger, 1997). Economic Theory thus predicts that increased international trade should lead to end of disparities; and globalization should bring about convergence of productivity and standard of living at the world level. But does historical experience support these convergence theories?

After the Second World War, there has been a phenomenal expansion in international trade flows. World exports increased from $61 billion in 1950 to $3447 billion in 1990. The share of world exports in world GDP rose from about 6 per cent in 1950 to 16 per cent in 1990 (see Nayyar, 1997). Trade openness is an important measure of globalization. It is defined as the combined weight of tradables – imports and exports in a country's economy. During the second half of the twentieth century, there has been a considerable increase in trade openness in most of the countries. Over 50 per cent of GNP of most industrial countries (with the exceptions of the US and Japan) is now directly affected by international price and demand changes (see Table 1).

Table 1: Trade Openness Core Industrial Economics (Exports Plus Imports as a Percentage of GDP)

Country	1960	1972	1985	1990
Canada	33.0	44.4	52.3	60.4
United States	8.5	11.9	17.8	22.0
Japan	14.7	21.2	28.7	36.5
West Germany	28.1	43.1	66.2	76.3
France	22.6	36.3	45.1	52.6
Italy	22.5	42.1	43.6	51.0
United Kingdom	42.9	53.0	56.3	62.6
Spain	14.7	29.9	36.1	45.1
Portugal	41.5	60.9	78.7	112.1

Source: Drache, 1996, p. 53.

With such rapid growth of international trade, economies have internationalized to a considerable degree. Global wealth and output, remain extremely unevenly distributed belying all the predictions of convergence theories.

Although increase in international trade is an important aspect of the process of globalization, it needs to be recognized that the present phase of globalization is essentially a finance-driven phenomenon. Each day billions of dollars move from one country to another. The global movement of capital has become the nerve center for the globalization of the international economy. Capital flows fall into two main categories (see Petrella, 1996, pp. 68-69).

The present phase of globalization is essentially a finance-driven phenomenon.

(i) Foreign Direct Investment (FDI), that not only implies financial capital transfers but also transfers of physical and technological capital;

(ii) Portfolio investment and various types of financial transactions (including speculative operations)

The expansion in FDI has been even more dramatic than in exports or international trade, especially since the early 1980s. The stock of direct foreign investment in the world economy increased from less than $5 billion in 1960 to $171 billion in 1992 (see Nayyar, 1997). Between 1983 and 1990 FDI flows expanded at an average annual rate of 34 per cent compared with an annual rate of 9 per cent for global merchandise trade. At the forefront of the economic globalization trend in recent years has been an explosive growth in international financial activity. In foreign exchange markets, trading increased from $15 billion per day in 1973 to $900 billion per day in 1992. The ratio of world-wide transactions in foreign exchange to world trade rose from 9:1 in 1973 to 90:1 in 1992 (see Nayyar, 1997).

This process of globalization has profound impact on the way are organizes the economic life. In the present era, it is claimed that greater part of economic life is determined by global processes, which leaves no room for national economies, no room for domestic

strategies of national economic management. 'The world economy is dominated by uncontrollable market forces, and it has as its principal economic actors and major agents of change truly transactional corporations, that owe allegiance to no nation state and locate wherever in the globe market advantage dictates' (Hirst and Thompson, 1996, p. 1). But is it the case? Are MNCs truly global? Is it true that national governments now have no control over domestic economic and political affairs? Is the process of globalization irreversible as is being claimed?

Evidence suggests that globalization is not a truly universal phenomenon. Although all countries are being affected in some way or other by the process of globalization, it is mainly industrialized countries (including newly industrialized countries) which are experiencing internationalization of their economies in a major way.

FDI is highly concentrated in the Triad of Europe, Japan and North America. With the exception of newly industrializing countries (NICs), the Third World remains by and large marginal. 75 per cent of the total accumulated stock, and 60 per cent of the flow, of FDI were located in North America (Canada and the US), Europe and Japan at the beginning of the 1990s. These members of the Triad dominate as both the originators and the destination for international investment. Whereas Japan remained a net exporter of FDI to both the other areas, the US was a net importer of FDI. The US became a net debtor nation in 1985 (for the first time since the First World War) and has continued to be so since then. It is true that there has been a slight widening of the geographical spread of FDI in recent years. The net FDI flows to some developing countries and regions (China and Latin and South America) have increased substantially since 1990. The overall pattern of the continued dominance of the Triad in FDI, however, remains largely undisturbed. The Triad countries, whose population is only 14 per cent of world population, attracted 75 per cent of FDI flows over the 1980s. If the populations of the ten most important developing countries in terms of FDI flows are added, it is seen that 43 per cent of the World Population was in receipt of 91.5 per cent FDI flows over this period (see Hirst and Thompson, 1996, pp. 63-67).

MNCs are not truly global entities as they are popularly described. There has been a long tendency in popular writings to exaggerate the rootlessness of MNCs. A study of leading MNCs from the United States, Japan and Germany reveals that, at root, the most strategically significant operations of MNCs continued to vary systematically along national lines. 'Across the areas of firm behaviour and the range of industries examined, relatively durable national institutions and ideologies appear to provide a more plausible source of basic differentiation than the obvious alternatives – industrial sector, firm/product maturity, and host environments'. Across the United States, Germany and Japan, striking differences in core aspects of corporate behaviour persist even as firms compete more intensively in their rivals' home markets. 'MNCs, at base, remain national firms with international operations. International politics determine the overarching contours of international markets' (Doremus, *et al,* 1998).

The most strategically significant operations of MNCs continued to vary systematically along national lines.

The global capitalist system is now facing a severe crisis. The creditability of the World Bank and the IMF is in tatters. George Soros, who is perhaps the most successful financial-market speculator in history (the source of his net worth of $25-30 billion is speculative activities), thinks that the global capitalist system that has been responsible for the remarkable prosperity of the US and many other countries in the last decade is coming apart at the seems (see Soros, 1998).

The Asian Financial meltdown which began in Thailand in July 1997 soon spread to other countries in the region. The Japanese banking system is in deep trouble. In 1998, the crisis spread to Russia and Latin America threatening the global financial system. The financial-sector collapse in Asia has had tremendous effect on the real economy. In Indonesia, for instance, most of the gains in living standard that were made during the last 30 years have disappeared.

Prior to the crisis, the macroeconomic fundamentals looked fine in most of the East and Southeast Asian countries. They had low inflation, booming exports and stable and rising foreign exchange reserves. East and Southeast Asia accounted for a quarter of world output, but fully half of world growth over the 1990s and almost two-thirds of world capital spending. However, what made for the high-growth performance of Asian system in the past led to the present crisis. Over the 1990s Western and Japanese banks and investment houses lent heavily to Asian companies. In order to win away business from one another, all lenders ignored their own prudential limits on lending to companies with high debt-equity ratios (see Wade and Veneroso, 1998). The Asian crisis however abruptly changed the direction of the flow of money. Capital started fleeing these countries.

The Asian crisis was a direct result of excessive financial deregulation; it was a crisis created by free mobility of capital. Firms were allowed to borrow abroad without any government control or coordination. When the crisis began, international creditors had run on the currency and domestic assets which compounded the crisis. The destabilizing role of financial speculators is even admitted by the IMF. A recent IMF report places some of the blame for the financial crisis on global investors who lent money to these countries and then rapidly withdrew it at the first sign of trouble. Capital flight is the root cause of Latin America troubles also. Brazil received a $41.4 billion IMF bailout in November 1998. But since investors kept pulling their money out of the country, the government was forced to devalue its currency and raise interest rates (see The Times of India, January 21, 1999). Likewise, the severity of the Russian crisis (or meltdown) has been unprecedented.

Why the US is such an ardent proponent of free flow of capital is explained by the fact that the US's peculiar position vis-à-vis rest of the world makes it the final destination of capital fleeing all over the world. The US today is the basis of globalized imperialism. The US economy has historically thrived on miseries of others. At least, this has been the case so far, although there is no guarantee that this will always be so. The financial crisis in East and Southeast Asian countries led to flight of capital from these countries to the US. This has provided a fillip to the US economy. As George Soros point out. "The Asian crisis reversed the direction of the flow. Capital started fleeing the periphery ...the reversal benefited the financial markets at the center. The US economy was just on the verge of overheating, and the Federal Reserve was contemplating raising the discount rate. The Asian crisis rendered such a move inadvisable, and the stock market took heart. The economy enjoyed the best of all possible worlds, with cheap imports keeping domestic inflationary pressures in check and the stock market made new highs". He, however, cautions that there comes a point when distress at the periphery cannot be good for the center (see Soros, 1998).

The breakdown in the global financial system can have severe disintegrating effects on the global capitalist system. To quote George Soros again "...financial markets are inherently unstable. The global capitalist system is based on the belief that financial markets, left to their own devices, tend towards equilibrium. This belief is false. Financial markets are given to excesses, and if a boom-bust sequence progresses beyond a certain point, it will never revert to where it came from". In the light of the destabilizing consequences of the financial liberalization trend discussed above, there has been a growing backlash in the last few years about neo-liberal financial thinking. Critics point out that instead of producing more efficient use of resources, financial liberalization has tended to encourage the growth of speculative, non-productive international financial activity. In foreign exchange markets, for example, increased capital mobility has resulted in large currency misalignments which in turn have disrupted international trading patterns and encouraged protectionist tendencies (Helleiner, 1996).

Financial liberalization has tended to encourage the growth of speculative, non-productive international financial activity.

The IMF policy prescriptions have played an important role in accentuating the present global crisis. The IMF's insistence on capital account convertibility goes far beyond its traditional concern with balance of payments adjustments. According to James Tobin, "South Koreans and other Asian countries like Mexico in 1994-95 are victims of a flawed international exchange rate system that, under US leadership, gives the mobility of capital priority over all other considerations". Jagdish Bhagwati, who is supporter of free trade but not of free capital mobility, says, "Wall Street has become a very powerful influence in terms of seeking markets everywhere. Morgan Stanley and all these gigantic firms want to be able to get into other markets and essentially see capital account convertibility as what will enable them to operate everywhere. Just like in the old days there was this 'military industrial complex', nowadays there is a 'Wall Street–Treasury Complex'...So today, Wall Street views are very dominant... They want the ability to take capital in and out freely. It also ties in to the IMF's own desires, which is to act as a lender of last resort. They see themselves as the apex body which will manage this whole system. So the IMF finally gets a role for itself, which is underpinned by maintaining complete freedom on the capital accounts... In my judgement it is a lot of ideological hum-bug to say that without free portfolio capital mobility, somehow the world cannot function and growth rates will collapse" (Jagdish Bhagwati quoted is Wade and Veneroso, 1998, pp. 18-19).

The Asian crisis has put the desirability of free movement of short-term capital in question. The benefits of capital account convertibility are being questioned even by some of the leading proponents of free trade. 'The world needs to understand more fully what the consequences are of unlimited international freedom of capital movements between countries that have vastly unequal levels of economic development and vastly different standards for monitoring their financial systems' (Pipeter Bottelier quoted in Wade and Veneroso, 1998).

There is then a clear case for restricting the free movement of capital. A reversal of the liberalization trend is more likely than is often assumed. While such a reversal would not bring an end to global financial activity, it would definitely reduce the degree of capital mobility (see Boyer, 1996). What should be the nature and mechanism of capital controls? Which institutions should be entrusted with the task of monitoring and regulation? These are however highly contentious issues. There are powerful governments (particularly the US government), international organisations and multinational corporations (Western and Japanese Corporations who are the big winners) devoted to maximizing the freedom of financial capital around the world (see Weiss, 1997). The IMF is strongly promoting capital account convertibility in all its programmes. Financial speculators favour capital account liberalization because under such a system financial capital is free to pick and choose where to go. These powerful vested interests who are in a position to force their views on others are opposed to any kinds of curbs on capital mobility.

One measure to curb 'super-speculative' element in foreign exchange trading, suggested by Tobin about 20 years ago, is to put a small transactions tax on the purchase and sale of foreign exchange. This measure can go a long to 'cool the casino'. But even such a small measure is not acceptable to the major players.

Nation State in the Era of Globalization

What is the role of nation state in this era? Can the governance of modern society be left to markets? Is the present situation where financial institutions dictate state policies acceptable? These issues are discussed below.

Although national economies were never closed systems, they were nonetheless able to control much of the economic activity within their boundaries until recently. National governments were responsible for stimulating economic growth, maintaining full employment, and promoting societal welfare within clearly delineated territorial boundaries. Nations considered their sovereignty and independence as something to be guarded at any cost. But now national governments are gradually losing control over domestic affairs. Welfare state is under attack virtually everywhere.

One of the principal problems of political economy is deciding on appropriate boundary between state and market. Market economy suffers from imperfections which lead to such ills as unemployment, extremes of wealth and poverty and excessive pollution. Government's intervention is necessary to correct these failures.

Sometimes market failures lead to deficiencies in economic outcomes. One serious deficiency is caused by presence of monopoly elements. To combat this decease, government need to regulate businesses or enact anti-monopoly laws to restrain business behaviour. Another type of inefficiency arises due to presence of externalities, especially negative externalities. Negative externalities occur when firms or people impose costs on others outside the market place.

Negative externalities such as air and water pollution, global warming, and nuclear and other hazardous wastes have now grown into major threats. Government regulations are needed to control these externalities. One very important functions of government is providing public goods (national defense, roads, public health and education, etc.). Market mechanism cannot be relied upon to produce public goods because benefits are so widely dispersed across the population that no single firm has an economic incentive to provide the service and capture the returns. Providing public goods thus becomes the responsibility of governments. Even more problematic than the defects in allocative role discussed above is the mal-distribution of income and wealth resulting from market system. Market economy produces highly unequal distribution of income and wealth which is just not acceptable socially. It is the duty of government to reduce market-generated inequality to acceptable limits. Another important role of governments is to foster macroeconomic stability and growth-reducing unemployment and inflation while encouraging economic growth. The contribution of Keynesian economics in the areas of macroeconomic management of economy has helped nations in controlling the worst excesses of the business cycle and in promoting long-run economic growth and productivity. Critics of government who see government as the problem rather than solution want to drive government out of all economic activities. They want to restrict state's activities largely to 'property rights enforcement, implementing pro-market reforms, enhancing private sector competitiveness and attracting foreign capital'. These critics forget that unprecedented economic growth achieved by advanced industrial countries during the last half-century could not have been possible without government in these countries successfully applying the lessons of Keynesian revolution... those who would reduce government to the constable plus a few lighthouses are living in the last century. An efficient and humane society requires both halves of the mixed system – market and government. Operating a modern economy without both is like trying to clap with one hand' (Samuelson and Nordhaus, 1998).

State's role in a modern economy cannot be reduced to just Keynesian fine-tuning. 'Modern government has to provide all the basic ingredients for competitiveness. At the top of the list are education, health, job training, research and development policies, infrastructure support, competition policy and so on, hardly a minor role for government at the end of millennium... The nation state, as mediating structure, make the strategic difference between winning and losing in a highly volatile international economy' (see Boyer and Drache, 1996).

Need for active role of state is much more in developing countries than in developed countries. Developed countries are now at a stage where most of their people enjoy reasonably good standards of living. Although, as discussed above, there are several areas (protection of environment, care of the poor, etc.) where presence of government is required, market may serve these societies better in raising their economic living standards even further. Markets also provide more choice which is valued highly by individuals once they are assured of basic necessities of life. Situation facing most developing countries is however entirely different. In developing nations, general levels of living are still low for the vast majority of people. 'These low levels of living are manifested quantitatively and qualitatively in the form of low incomes (poverty), inadequate housing, poor health, limited or no education, high infant mortality, low life and work expectancy, and in many cases, a general sense of malaise and 'hopelessness'. Human development in these societies without active role of state is just not possible. The vast majority of people in developing countries are without any ownership of means of production and without abilities and skills suited for modern market place. Market does not have much to offer to such people.

Amartya Sen, the winner of the Nobel Prize for Economics in 1998, believes that the welfare of a society cannot be left only to market mechanism. Sen in his recent works has emphasized on depravations of elementary human capabilities that reduce the ability of the poor to take advantage of economic opportunities. Income is significant because of the opportunities it creates. But actual capabilities also depend on a number of other factors. According to him, education and health are also part of the capabilities that individuals must have so as to be able to make good the opportunities available to them. Sen in a supporter of globalization and economic reforms but he stresses that these need to be supplemented with public action to enhance human capabilities. In the context of India, he wants that the process of economic reform and that of expanding social opportunities should be carried out simultaneously with a lot more energy in the expansion of social opportunities than has been given to it in the past. Even while supporting economic reforms, he has relentlessly campaigned that the government must intervene more on behalf of the poor '... only by providing for a certain economic security to the poorest of the poor the country could meet the challenge of globalization'.

Amartya Sen believes that the welfare of a society cannot be left only to market mechanism.

Even after 50 years of independence, the education backwardness of India is quite glaring. Only about half of the India's adult population is literate. Other indicators of mass education are equally dismal. Combined first, second and third level gross enrolment ratio is 55 per cent; the overall (adult) female literacy rate in 1995 was 37 per cent.

Illiteracy remains endemic even in the younger age groups. At the time of independence, the government had set 1960 as the target date for achieving free and compulsory education up to the age of 14. This target still eludes us. Inadequate investment in education and other social sectors has been one important shortcoming of our planning process. The market mechanism does not work in case of education because it is like a public good (many external effects are associated with it). It is basically the responsibility of the state to provide resources for education. At present public expenditure on education as a percentage of the GNP is only about 3.5 which is far below the targeted level of 6 per cent. Similarly, the government's involvement in other social sectors (nutrition, health, social services, etc.) also needs to increase substantially.

Developing Countries in Reforming IMF

Policy-makers who are supporters of globalization present complex arguments requiring the deregulation of public policy as a goal in itself. It is true that India, like any other country, cannot escape the rapid process of integrating with the world economy. But with increasing integration, the government's responsibility of regulating the real economy and the financial sector, especially the international capital market, does not diminish but increases. The main cause of the East Asian crisis, according to Lance Taylor, was inadequate government regulation. Deregulation created "strong incentives for destabilizing private sector financial behaviour, on the part of both domestic and external players. Feedback of their actions to the macro-economic level upset the system" (Lance Taylor quoted in Sengupta, 1999). The

main reason why India and China have not gone the East Asian way is that they did not allow free capital account convertibility.

It is argued that developing countries need to attract international capital to upgrade their technological capability and level of competitiveness without which it is not possible to increase their share in world exports. Manmohan Singh argues that "Developing countries need to attract the global movement of capital. In fact, the level foreign direct investment in a country is a barometer of its economic health. Developing countries desperately need to increase the share of exports in the world trade if they are to provide a better standard of living to their people. This is only possible if they have the capital and the technological infrastructure to make their industry world-class so that it can compete in a quality and price conscious international market" (Manmohan Singh, 1994).

But it needs to be recognized that not all types of capital inflows add to the production capacity of the economy. "Direct Foreign Investment (DFI), and that too not all of it but only a part of it, genuinely adds to the productive capacity of the economy. this is the DFI which locates production on our soil for meeting the global market or which produces goods essential for us but for which we lack the technology. And all capital flows in the form of deposits or portfolio investments constitute short-term flows that are essentially speculative in nature which do not add directly to productive capacity" (Patnaik, 1999). Financial capital has a tendency to get concentrated in the metropolitan centers where it enjoys greater social acceptability and feels safer. To attract international capital developing countries are forced to offer real interest rates on average than those prevailing in the developed countries. The increase in interest rates not only has an adverse effect on productive investment directly but also makes the servicing of public debt more expensive (see Patnaik, 1999).

The current global financial order resembles a casino. The present globalization trend which is dominated by financial market cannot and should not be allowed to continue. There is a definite need for curbing speculation. Developing countries in particular need to take steps to safeguard their people against the harmful effects of the present globalization trend which forces them to integrate into the world system on unequal terms.

Some countries individually have started opting out of the global capitalist system. Malaysia has taken several steps to control the activities of foreign investors and speculators. Such measures however cannot be expected to provide long-lasting relief. The malady is systemic; it needs to be tackled globally not nationally. The join communiqué issued at the end of the G-15 summit held recently at Montego Bay talks about developing mechanisms and adequate rules to monitor and supervise the operations of large financial players, including hedge funds and currency speculators. Developing countries need to take a united stand in the third WTO ministerial meeting as well as in future international negotiations on matters related to reform of international monetary system, India, China and other big developing countries can play an important role in bringing greater stability to the crisis-ridden global financial markets.

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World-Class Manufacturing & Global Competitiveness

K.B.C. Saxena & B.S. Sahay

Consequent with the economic liberation envisaged through globalization of industrial collaborations, organizations, especially in developing countries are at present in the midst of revolutionary transformation: that of competition shifting from the 'industrial age' to an 'information age'. The emergence of the information era coupled with rapid changes in industrial technology have made the business practices, marketing strategies, customer orientation of companies in developing countries like India obsolete. So merely deployment of new technologies will not suffice. Furthermore, availability of cheap labour may not be advantageous for ensuring global competitiveness. The present paper examines the issues arising out of the globalization and suggests measures for better global competitiveness and ensuring better manufacturing excellence in Indian industry.

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Introduction

Organisations are at present in the midst of a revolutionary transformation: that of competition shifting from industrial age to information age. During the industrial age, companies succeeded by how well they could capture the benefits from economies of scale and scope. Technology was important, but ultimately success accrued to companies that could embed the new technology into physical assets that offered efficient mass production of standard products. The emergency of the information era, which started in the last decades of the twentieth century, made obsolete many of the fundamental assumptions of industrial age competition. Consequently, companies could no longer gain sustainable competitive advantage by merely deploying new technology into physical assets rapidly. Intangible assets enable an organisation to develop customer relationships and loyalty, introduce innovative products and services, produce customised high-quality products and services at low-cost and with short lead times, mobilise employee skills and motivation for continuous process improvements, and deploy information technology effectively.

Challenges of the Information Age

Information age competition has initiated some unique challenges which the businesses have to cope up with (Luftman, 1996). These are as follows:

Managing Uncertainity

Business environment's uncertainity has become a way of life. Consequently companies are finding it even more difficult to predict in their competitive environment. Customers are becoming competitors, competitors are becoming partners, and unconventional competition is emerging. Business, however, must go on despite potentially dramatically new

business environments that are at present not well understood.

Business environment's uncertainity has become a way of life.

Understanding Customers

It has become important to understand customers' needs and wants deeply and to translate these into a unique value-added business mission. Companies capturing and applying information at each point of customer contact will, therefore, be better off than those that do not. Consequently companies will have to be able to apply and integrate information technology into the entire product process (including research, design, manufacturing, distribution, marketing, and after sales service).

Understanding globalisation of business

Globalisation is defined as a process cuts across national boundaries, integrating and connecting communities in new space-time combinations (Hall *et al,* 1992). As information technology (IT) breaks down the barriers of time and location, distinctions are also breaking down between large and small companies. Small, agile firms are now effectively competing with industry giants because IT can make a consortium of small firms look, feel and get big, reaching for customers once beyond their grasp. This has given rise to intense competition blurring the boundaries between domestic and global markets.

Globalisation

Since World War II a number of factors have changed the manner of competition in the global business community; the particular catalyst for globalisation may vary among different industries (Porter, 1986). Additional causes include falling political and tariff barriers, a growing number of regional economic pacts that facilitated trade relations, and the increasing impact of the technological revolution in restructuring and integrating industries. Manufacturing issues associated with flexibility, labour cost differentials, and other factors also play an important role in these market trends. Widespread globalisation is also evident in a number of industries, such as software, telecommunications and services.

Consequently the economic activity today is becoming not merely internationalised but, more significantly, it is becoming increasingly globalised. 'Internationalisation' refers simply to the increasing geographical spread of economic activities across national boundaries, which as such is not a new phenomenon. Globalisation of economic activity is qualitatively different. It is more advanced and complex form on internationalisation which implies a degree of functional integration between internationally dispersed economic activities. Though globalisation is a more recent phenomenon; however it has already emerged as the norm in a growing range of economic activity. Almost every sector of business are influenced by global forces due to globalisation (Porter, 1986). Globalisation is characterised by:

- tightly linked global financial market;
- global sourcing of inputs, marketing and distribution of production, and manufacturing of products and final products;
- increased pressure for improved product quality and reduced product price; and
- evolution of business toward more comprehensive and continuous global coordination and integration.

'Internationalisation' refers simply to the increasing geographical spread of economic activities across national boundaries, which as such is not a new phenomenon.

To compete successfully in this dynamically changing environment, firms need to be able to address effectively several key strategic issues:

Cost-quality improvement through coordinated manufacturing: Global competitive pressures push strongly to reducing product delivered cost and at the same time to improve significantly the quality of the product and all aspects of customer service. A common strategy used by the firms for achieving this goal is to tighten significantly all aspects of manufacturing process, which includes coordination strategy such as 'just-in-time' (JIT) and overall quality-improvement programmes (Imai, 1986; Suzaki, 1987).

Cost-quality improvement through concurrent engineering: Another key element is better design of the product for manufacturability. To do this integrated design teams are formed, pulling together product design, engineering and manufacturing. The objective is

to design a product for manufacturability as well as for other objectives. In some cases packing and distribution, marketing and R&D functions and also brought into the concurrent engineering process (Dean and Sussman, 1989).

Order cycle: In many industry sectors as automobile, the product is built to customer order and customer specific. The 'order cycle' begins when the customer places an order, and ends with the delivery of the completed product to the customer. In these sectors, therefore, a very key competitive issue is to shorten significantly the time the cycle takes, for delivering the product to the customer as soon as possible (Stalk and Hout, 1990).

After-sales customer support: Customer support after the sale is a critical issue. Customers are demanding a high level of service for maintenance including spare parts availability and technical skills in service staff. Add on products and services such as training, documentation, product upgrades, are also required. A high level of customer support capability is required, but it can also be profitable.

Design cycle: In many industries, product life is becoming shorter product lives. The time it takes to conceive of a new product, design it, put it into manufacturing, and deliver it to the market with a full support network in place—the design cycle—is becoming shorter and shorter. A shorter design cycle also means a newer technology put on the market. The company that takes six years to design a new car model today must be using the 1992 technology, while the company with three design cycle may be competing with 1995 technology.

Globally-coordinated Flexible Manufacturing and R&D: Global sourcing of component and sub-assemblies, global distribution into multiple markets, and an efficient use of a network of global manufacturing and assembly parts, is leading to globally-coordinated manufacturing. In this new style of 'flexible manufacturing', the objective is to coordinate production planning and scheduling among multiple plants in many countries, and across product line, to respond to changing market and production conditions.

Global coordination of research and development is driven by the need for product development for global markets, and by the recognition that unique research competency exists in many different countries and cultures. At the same time that a company strives to tap these competencies, it also usually wants to take a cost-effective approach in that undesired duplication and overlap be minimised. Managing R&D in a global situation is specially critical. For example, in the pharmaceutical industry, clinical trials and regulatory approval applications must be undertaken in many countries relatively simultaneously.

Indian Scenario

According to a recent report[1] from World Bank on global economy, developing countries over the next ten years will grow by nearly 5 per cent a year compared with a rate of 2.7 per cent in the rich industrial world and by 2020 India should be the 4th largest economy in the world. Unfortunately, contrary to this prediction, India ranks number 45 in global competitiveness among 49 countries, according to 1996 Global Competitiveness Report of the World Economic Forum. From 35th in 1994 to 39th in 1995, and now to 45th, India's decline in its competitiveness is shocking. For a country such as India which needs high growth levels to generate enough resources to alleviate poverty levels, this is a dangerous prognosis. It is, therefore, critically important that immediate steps be taken to reverse this trend.

For a country such as India which needs high growth levels to generate enough resources to alleviate poverty levels, decline in competitiveness is a dangerous prognosis.

Manufacturing is the process of adding value to raw materials and resources and is at the heart of an economy. The last decade has witnessed fierce competition in the international markets led by Japan and the newly industrialised countries' major competitive advantage. As against cheap labour experience, market share and technology innovations are greater determinants of cost leadership than the cheap labour (Chandra and Shukla, 1994). Superior product quality, design innovations, robust delivery performance, customisation, and excellent after-sales service are the distinctive manufacturing characteristics needed to gain competitive advantage. The ability to deliver these capabilities rests on the management's perspective on competition and the manufacturing practices of the company.

Historically Indian industries developed management practices which suited the restrictive industrial policies of the past. Until the early 1980s, the demand for most manufactured goods was exceedingly the supply. Con-

1. "The Global Economy", *The Economist* (October 1, 1994).

sequently Indian manufacturers preferred to exploit the limited and yet adequate domestic market. Since the restrictive policy regime suited and reinforced their inward orientation, their industrial management practices did neither emphasise consumer orientation nor the manufacturing excellence needed in a competitive environment. The opening up of the Indian economy to global competitive forces posed new challenges and opportunities to Indian manufacturers. Indian industries started seeking export markets which have become attractive following the decline in the value of Indian rupee. But an industry's competitive advantage cannot be built nor sustained solely by the export market orientation. Development of domestic market is a vital determinant of the competitive advantage of an industry (Porter, 1990). The size, consumer sophistication and the growth of domestic demand shape the characteristics of an industry's products which are essential to the competitive success in foreign markets. India has a large market which can provide domestic industries the scale economy that is essential for cost leadership. But the quality of domestic demand rather than its quantity is more important in shaping the competitive advantage of domestic industries. Quality of domestic demand has never been nurtured by Indian manufacturers[2]. To successfully compete with the world class manufacturers in domestic as well as global market, Indian firms will have to offer high quality product choices to domestic customers in order to create a sustainable base for national manufacturing excellence!

Manufacturing Excellence

In the changed globalised business environment, it is no more feasible to compete only on the basis of costs without paying attention to the real customer preferences represented by other product dimensions. Consequently, many new manufacturing approaches have emerged over the recent time mostly as the reaction to dynamically changing situation on the market place, where increased competition and market globalisation greatly affected the distribution of the market share and the profit margins. These new approaches to manufacturing are based on a pragmatic philosophy distilled from worldwide experience in manufacturing. Manufacturing Excellence could be attained by a combination of several approaches to manufacturing such as the following (Hall, 1987):

(i) Value-added manufacturing, which means do nothing that does not add value to the product or to the customer;

(ii) Continuous improvement manufacturing, which suggests that every aspect of manufacturing is dedicated to making it better in ways great and small; and

(iii) Just-in-time (JIT)/Total quality control.

It is no more feasible to compete only on the basis of costs without paying attention to the real customer preferences represented by other product dimensions.

World class manufacturing was the goal of achieving and/or sustaining world class competitiveness through manufacturing excellence attained through best practices. In this context, different experts have expressed the goal and necessary practices for world class manufacturing differently but always with the implicit goal of sustained competitiveness in the global market place. For example, Schonberger, who introduced the term "world class manufacturing" (1986), states that world class manufacturing has the goal of continual improvement in quality, cost, lead time and customer service, as also the flexibility. Gunn (1987) suggests a number of criteria for evaluating a company's world-class manufacturer status, such as inventory turnover, quality defects, and lead times. According to Gunn, a company needs inventory turnovers in raw materials and work-in-process (WIP) of some 25 to 30 per year to be a Class C world-class manufacturer, about 50 to 60 turns per year for a Class B status, and on the order of 80 to 100 turns or more per year to be a Class A world-class manufacturer. As measure of world-class quality, a Class A manufacturer should have fewer than 200 defective parts per million of any product it manufactures. As for lead times, the ratio of value-added lead time to cumulative manufacturing lead time must be greater than 0.5 for a company to be a world-class manufacturer.

Maskell (1991) states that world class manufacturing is a very broad term which generally includes focus on product quality, just-in-time (JIT) production techniques, work-force management, and flexibility in meeting customer requirements. Kinni (1996) characterises world class manufacturing by three core strategies of customer focus, quality and agility (i.e. the ability to quickly, efficiently and effectively respond to change), and six supporting competencies-employee involvement, supply management, technology, product development, environmental responsibility and employee safety, and corporate citizenship.

2. India ranks 42nd out of 49 countries in Total Quality Management according to 1996 Global Competitiveness Report.

Information age has not affected merely the industrialised countries but also the developing countries. Consequently, the environment facing developing countries has also become increasingly more turbulent, dynamic and complex. A combination of external and internal factors including population growth, weak infrastructure, foreign indebtedness, asymmetric world relations and increasing inequalities between individuals, groups and regions has prevented many developing countries from achieving significant socio-economic improvements. Some developing countries such as India have, therefore, made economic management their prime agenda. They are going through a process of restructuring their economy to emphasize competition, integration with global markets and increasing level of privatization. Consequently Indian manufacturing industry has been thrust from the protected environment of the "licence-permit-quota" raj to an uncertain environment of global competition and global markets.

Global competitors operating in global markets almost always tend to have world-class status as defined above. Therefore, to be globally competitive, Indian manufacturers necessarily need to achieve world-class performance. Oddly enough, as stated before, developing countries such as India, China and Brazil themselves constitute a huge market which attracts many world-class companies from other countries to sell their products in these countries. The domestic companies in these countries, are also constrained to compete with these world-class companies by virtue of their entry into the domestic market.

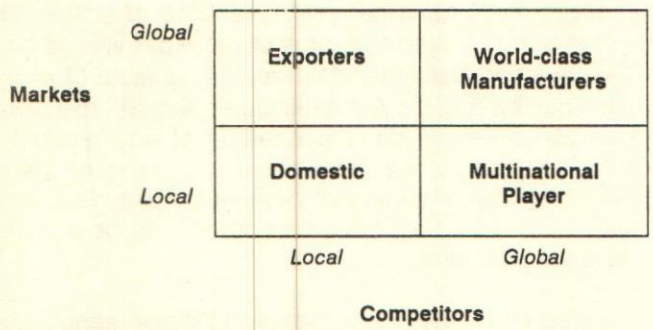

Fig. 1. World-Class Manufacturing

Thus, from Fig. 1, it is evident that Indian manufacturers need to acquire the world-class status irrespective of the fact that they are operating only in the domestic market or are an exporter as well. Needless to mention though that achieving world-class performance is a great opportunity for those who can make it, and for others, a serious threat. Though to some extent the Indian manufacturers have realised this and trying to rise to the challenge, will depend on their readiness to move themselves from a protected domestic to world-class global manufacturing status quickly and confidently.

Manufacturing Strategies in the Information Age

Most manufacturing companies are now experiencing rapid and continuous change in their business environment, which can be identified in terms of product change and/or in terms of process change (Luftman, 1996). *Product change* characterises the demands for new goods or new services. Companies change their products because of competitor moves shifting customer preferences, or the entry to new geographical or national markets whereas *Process change* concerns reformation of procedures and technologies of products development and services.

These two types of changes can be classified as either stable or dynamic. Stable change is slow, evolutionary, and generally predictable, while dynamic change is rapid, often revolutionary, and generally unpredictable. Taken together, these two types of changes provide a matrix of four possible combinations of "change conditions" that can confront an organisation. Thus a matrix can be built in which each of these combinations defines a strategic business model appropriate to the conditions (Fig. 2). This matrix of manufacturing strategies can serve as a valuable lens through which an organisation can (i) assess its competitive position by understanding where it has been in the past; (ii) continuously choose a strategic business model appropriate to the present and (anticipated) future environment, and (iii) clarify how to strategically align the business and IT strategies, infrastructure, and process appropriate to the strategic model. The matrix combinations and the relevant manufacturing strategies are described below.

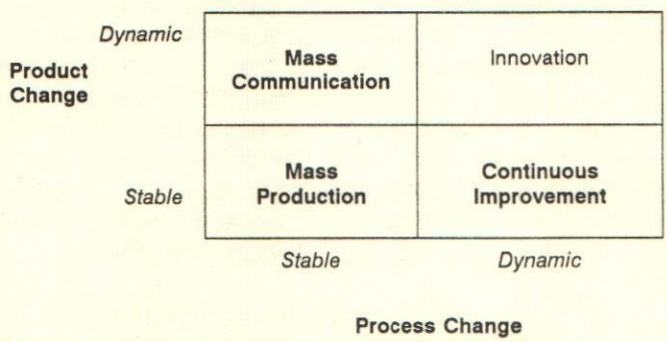

Fig. 2. Manufacturing Strategies for Change

Innovation strategy: The focus of innovation strategy is to frequently create small volumes of new

products, while constantly innovating the process required to develop and produce them. These organisations are often separate research and development (R&D) units within mass production organisations, such as Bell Laboratories. Such organisations are inherently designed for change since product specifications and work processes are unpredictable and constantly shifting. To compete under innovation conditions, organisations decentralise decision-making, broadly define jobs, develop few rules or procedures, and subjectively evaluate performance.

The focus of innovation strategy is to frequently create small volumes of new products, while constantly innovating the process required to develop and produce them.

Mass production strategy: Throughout the twentieth century, most large organisations have competed under the conditions of relatively stable and predictable product specifications and demand. This permits them to standardise products, centralise decision-making, routinise work and reward, develop and enforce standard rules and procedures, and allocate work to dedicated, specialised jobs – i.e. to mass-produce goods or services. The focus of these firms is on efficiency through stability and control, always basing their strategy on economies of scale and low costs, and striving for the largest size and lowest cost structure in the industry. The organisational structure of such firms is often large, hierarchical, bureaucratic, and vertically integrated. Their competitive advantage and profitability are based on reduction of unit costs, and therefore change in either process or product is anathema to the mass production strategy. Consequently, the design for stability requires limiting both product variety as well as process innovation.

While mass production and innovation have been the predominant forms of competitive strategy during the 20th century, today the situation has changed with neither simultaneous dynamic product- dynamic process change nor simultaneous stable-stable change. In such a situation, two more strategies emerge as an option to manufacturing firms.

Mass customisation: Organisations in a number of industries are facing customers making increasingly unique and unpredictable product demands. However, the basic processes that these companies are instituting to meet these demands soon evolve into identifiable patterns enabling the companies to build stable but flexible platforms of process capabilities. Such companies, therefore, need to be organised and managed for mass customisation (Pine, 1993). It is the ability to serve a wide range of customers and to meet changing product demands through product variety and innovation, while simultaneously building on existing long-term process experience and knowledge that results in increased efficiencies. The focus of these firms is on individual customer fulfillment through flexibility and responsiveness. The major distinguishing characteristic of the mass customisation strategy is the capacity to produce product variety rapidly and inexpensively. This requires a set of modular process capabilities with a linkage system that allows them to be brought together instantly for any particular customer order. Consequently, instead of centralising all decision-making for a single value chain, these organisations centralise coordination and control in the hub of a web of loosely linked processing units.

Organisations in a number of industries are facing customers making increasingly unique and unpredictable product demands.

Continuous improvement: In some industries, such as automobiles and machine tools, the nature of product demand is still relatively mature, stable, large, and homogeneous. But the competition in these industries is based on dynamic process terms, i.e. the organisations are competing by achieving constant improvement in process quality, speed, and cost. The focus of organisations in these industries is on customer satisfaction through process improvement. As opposed to mass production firms, they are very customer-or market-focussed, striving to better satisfy the market as a whole through continuous process improvement. These organisations manage rapid innovation and use of new process capabilities and therefore require systems and structures that facilitate long- term organisational learning about product but simultaneously achieving radical changes in the processes. To make process innovation efficient, these organisations employ cross-functional teams that collaborate to improve processes or plan for product enhancement. The members of these teams then turn to their function-specific work and execute the rules they just developed, accomplishing a sort of micro-transformation. In this sense the teams of continuous improvement firms need to be as process-innovative as 'invention' organisations, and as process-efficient as 'mass production' firms.

Manufacturing Challenges of the Information Age

Time-based Competition

Time is the primary competitive motive of business in the 21st century. It does not mean, however, that other motives such as cost, quality and service can be ignored. In fact these are prerequisites to sustain competitiveness. But the winning factor is provided by time (Stalk, 1988) and enhancement to the basic products. Reducing time is not critical in and of itself-it is the benefits achieved through time reduction, in the form of greater cash flow, less inventory, quicker customer response, and ultimately, greater profits, which make time-based competition worthwhile (Handfield, 1995). Moreover, time-based competition does not just refer to manufacturing but to the entire product/value supply chain, which includes product development, order processing, supplier delivery, reproduction, manufacturing, final assembly, and distribution. Thus, in the manufacturing environment, time-based competition becomes the highest priority to gain responsiveness and flexibility. (Fig. 3) (Meyer, 1990).

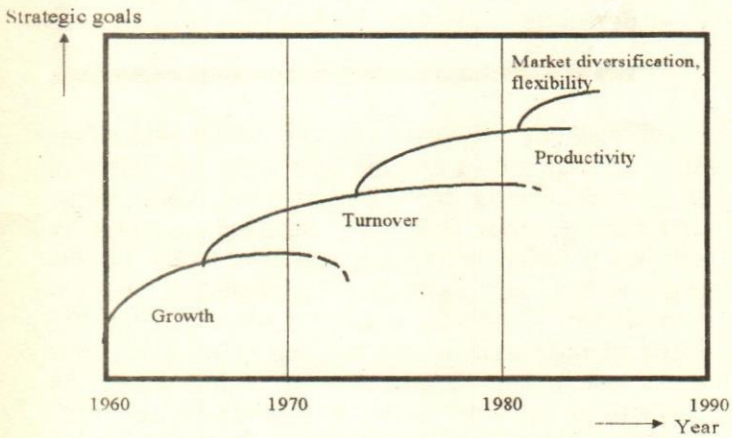

Fig. 3. Changing Business Goals in Changing Environment

Responsiveness and flexibility have several important dimensions (Table 1). One is product-mix, the need to support maximum variety in end products with minimal disruption to the manufacturing operations. Other relate to upgrading of plant and equipment in order to start product quickly. The driving force behind this priority force behind this priority setting is the need and the wish to respond to virtually any customer request just-in-time. Flexibility, on the other hand, is the response of a system to environmental uncertainities ('the unknown customer'). Thus, the 1990s will need an information culture to manage uncertainities; which will no longer be pushed forward by technology but will be controlled by information feedback. This leads us to the second challenge industries are facing today: how to manage knowledge.

Table 1: Flexible Manufacturing Parameters for Meeting Business Objectives

Business objectives	Flexibility
Product innovation	Product technology
Product diversity	Product mix
Customer requirement	Design
Market share	Volume
Meeting delivery dates	Routing, sequencing

Managing Knowledge

In the 21st century, the productivity and, even more important, the effectiveness of managers and white-collar workers will become critical to long-term survival. The effectiveness of these experts depends on their smooth integration into the organisation. Therefore, in the era of advanced specialisation, integration of dispersed knowledge will become progressively more difficult to accomplish and more costly to achieve. Knowledge will become scarce and the most crucial and expensive economic resource.

Problems in the Manufacturing Industry

Coordination

Once a company has defined its manufacturing strategy, it has to initiate mechanisms for managing product complexity as well those for managing demand uncertainity in the form of uncertain orders, both perhaps at the same time. The challenge of managing product complexity is to improve productivity (goal of 'mass production' strategy) whereas the challenge of market uncertainity is to improve flexibility (goal of 'mass customisation' strategy) (Meyer, 1990). Product complexity is managed by breaking down a manufacturing task into a number of sub tasks and operations. Executing these sub tasks and operations in parallel improves productivity. But if different subtasks are performed by different workers ('division of labour'), then the productivity improvement is restricted by coordination costs which may otherwise exceed the productivity gains. This is also true for the expert knowledge, which is the other resource required to execute operations. Thus a basic problem in manufacturing is the problem of coordination, which could be stated as follows:

- After exploding a manufacturing task into thousands of subtasks, how difficult and costly

is it to assure their proper sequencing, scheduling and interaction-over a period of time?

- After dividing the task expertise among hundreds of 'incomplete expert' workers, how difficult and costly is it to maintain their coordination, motivation and performance?
- As we are used to divide information into millions of tiny bits, how difficult and expensive is it to achieve its requisite integration, record and update?

As the complexity and cost of integration and coordination becomes too large, one tends to focus on the question of reintegration. In this context, just-in-time (JIT) efforts aim at the reintegration of physical labour (via flow lines) whereas computer-integrated manufacturing (CIM) anticipates the reintegration of special expertise organised in functional departments through integrated information processing.

Need for Control

As for managing task complexity, coordination is required, likewise to manage market uncertainity, planning and control is required. Management by hierarchical planning and control copes with uncertainities by adaptation to environment and optimisation of controller parameters. For instance, a production schedule should be optimised to increase system responsiveness to demand, i.e. (i) to keep due dates, (ii) to reduce total flow-time, and (iii) to balance factory loads. This is the planning problem. On the other hand, the control problem deals with machine-sharing policy, lot splitting and job sequencing. That is, with (i) exploiting resources efficiently, and (ii) respecting due dates in the face of uncertainity. In general, the breakdown of long-to-short term planning decisions indicates levels in the complexity of decisions. This is managed by defining a family of decision problems and generating solutions in a sequential top-down manner.

Fragmented Information Infrastructure

Today the manufacturing industry is still striving for stability of its production system as a major organisational goal. Therefore, in most manufacturing firms, management of change is not yet considered a permanent objective. Whether JIT or CIM, whichever way the task coordination is managed, a seamlessly integrated information infrastructure is a must. However, information processing is still very much fragmented even in computerised applications (Sahay *et al*, 1997). Therefore, in many companies the decision-making process is still based on traditional information processing-information gathering with 'paper and pencil' on request and from inconsistent sources. This process is at the least very time consuming and may yield only insufficient or even unreliable information.

Insufficient Processability of Available Information

In addition to having a fragmented information infrastructure, most companies are still not organised for fast decision-making processes. Departments are still managed according to their own sub-goals rather than to real enterprise goals. The responsibilities for enterprise assets with those for enterprise operations.

Conclusions

With the dawn of the information age, the requirements for remaining competitive in manufacturing have become more demanding. Only recently, high quality and efficiency were the 'necessary and sufficient' conditions for staying in business, but not anymore. Now manufacturers must be able to rapidly develop and produce customised products to meet customer needs. To further complicate matters, the requirements for economies of scale, based on the traditional assumptions of mass production, are coming into direct conflict with the requirements for economies of scope—that is, mass customisation by maintaining continuous innovation while using people and equipment to cost-effectively produce smaller amounts of a range of products. And, on top of it, globalisation has imposed an additional constraint, that manufacturers must achieve world-class manufacturer status to compete effectively in both domestic as well as global markets. This requires a paradigm shift within organisations, which may be termed as integrated manufacturing, and which aims to eliminate barriers by creating a streamlined flow of automated, value-added activities, uninterrupted by transportation, storage, or rework (Dean and Snell, 1996; Snell and Dean, 1992). Integrated manufacturing is driven by the widespread adoption of advanced manufacturing technology (AMT), total quality management (TQM), and just-in-time (JIT) inventory control, which together have important strategic potential in that they blend the stages, functions, and goals of manufacturing. Rather than viewing performance as thee result of trade-offs between, for example, cost and quality, the 'integrated manufacturing' perspective posits that firms can pursue several outcomes simultaneously (Ferdows and DeMeyer, 1990).

Currently most manufacturers in India are no where closer to world-class status. They, therefore, have to face the challenge of meeting world-class performance through flexibility and responsiveness achieved by effective planning, control and coordination enabled by

integrated manufacturing and effective knowledge management. Unfortunately, there have been many discussions on national infrastructure and macro-economic policies in the national media but very little attention has been paid in designing policies that map managerial practices to manufacturing excellence of world-class status. While macro-economic factors affect the investment climate and the extent of resources available to enhance productivity, they fail to define and control the parameters of competition, viz. cost, quality, delivery and flexibility (Chandra and Shukla, 1994). The economic reforms in India have already started opening up new challenges and opportunities before the Indian industries. Whether the Indian firms will be able to capitalise on these opportunities and elevate themselves as viable global competitors, shall depend primarily on their dynamism and ability to transform themselves into world-class manufacturers—the sooner, the better and perhaps safer!

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World Clothing Export Markets: Where do Indian Firms Stand?

Sanjay K. Jain

India has been in the mainstream of clothing exports for more than three decades. The present paper examines India's current position in the world clothing exports. It also reports the findings of a survey carried out by the author for ascertaining competitiveness of the Indian garment export firms. The study assumes a critical significance at a juncture when the process of liberalization of world trade in textiles and clothing has already begun under the auspices of the Agreement on Textiles and Clothing (ATC). With the phasing out of quota restrictions on clothing exports by year 2005, assured market access available to the export firms heretofore due to imposition of quotas on clothing exports from the developing countries would no longer be available and the Indian firms would have to compete on an equal footing with other players in the world market.

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Introduction

Clothing has been the mainstay of India's exports for a long time, and in 1997-98 exports were of the order of US$ 3,776 million-accounted for 11.12 per cent of the country's total exports (Economic Survey; 1998-99). No doubt India's clothing exports during the last decades have undergone dramatic changes in both the quantitative and qualitative terms, India's export performance at the international level has not been much satisfactory. World clothing exports as per the World Trade Organisation's Annual Report (WTO 1998) were US$ 176,610 million in 1997. Though India held a position of the 9th largest exporter in the world, its performance cannot be considered much satisfactory due to its lower level of exports. With an export figure of only US$ 4,217 million, India's share was just 2.4 per cent in world clothing exports in 1997 (see Table 1 and Fig. 1).

In terms of growth too, India's performance is not very good. While India's garment exports grew by 10 per cent during 1990-97, corresponding growth rates of the countries like China and USA have been much higher. Each witnessed a growth of 19 per cent in their clothing exports during this period.

Table 2 contains data on percentage shares of the leading suppliers of clothing in the four principal clothing importing countries of the world. In the case of Japan, India's performance has been very poor. India stood at 13th position with a share of just 0.6 per cent in 1997. Indian firms, however, appear to be doing well in the United States, Canada and European Union where they held 5th, 6th and 10th ranks with percentage shares of 5.4, 2.9 and 3.2 per cent respectively.

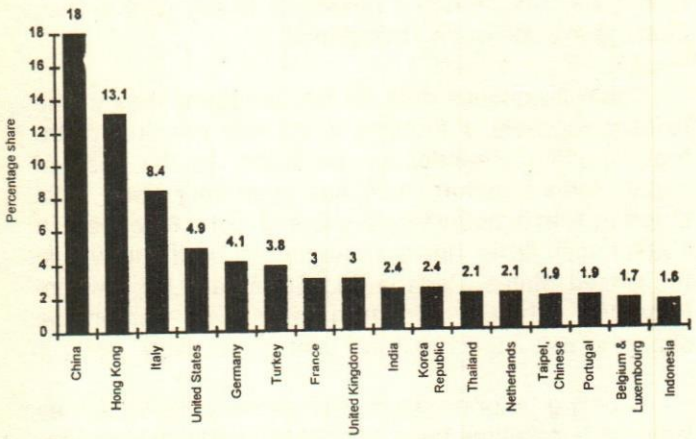
Clothing exports from the developing countries have for a long time been subject to quantitative restrictions. In the sixties and early seventies, these restrictions were imposed under the Short Term and Long Term Arrangements Regarding International Trade in

Table 1: Leading Clothing Exporters in the World

Rank	Exporter	Value in 1997 (Billion US$)	Percentage share in world clothing exports			Annual percentage change (1990-1997)
			1980	1990	1997	
1.	China	31.80	4.0	8.9	18.0	19
2.	Hong Kong, China	23.11	–	–	–	6
	- domestic exports	9.33	11.5	8.6	5.3	0
	- re-exports	13.78	–	–	–	12
3.	Italy	14.85	11.3	11.0	8.4	3
4.	United States	8.67	3.1	2.4	4.9	19
5.	Germany	7.29	7.1	7.3	4.1	–1
6.	Turkey	6.70	0.3	3.1	3.8	10
7.	France	5.34	5.7	4.3	3.0	2
8.	United Kingdom	5.28	4.6	2.8	3.0	8
9.	India	4.22[1]	1.5	2.3	2.4	10[2]
10.	Korea	4.19	7.3	7.3	2.4	–9
11.	Thailand	3.77	0.7	2.6	2.1	8
12.	Netherlands	3.66	2.2	2.0	2.1	8
13.	Taipei, Chinese	3.41	6.0	3.7	1.9	2
14.	Portugal	3.30	1.6	3.2	1.9	–1
15.	Belgium & Luxembourg	3.01	2.5	1.9	1.7	6
16.	Indonesia	2.90	0.2	1.5	1.6	8

Source: Based on data compiled from WTO (1996), Annual Report 1998. Rankings of the countries from France onwards are different from those reported in the WTO Annual Report 1998 because of inclusion of India's export data in the table by the author.

Notes: 1. Relates to nearest year.
2. Relates to period 1990-97.



Note: Hong Kong's share inclusive of domestic exports and re-exports.

Fig. 1. Percentage Shares of Top Sixteen Clothing Exporting Countries in the World Clothing Exports in 1997

Table 2: Clothing Imports of Selected Countries by Major Suppliers

A. *USA*	Percentage share (1997)	B. *Canada*	Percentage share (1997)
China	15.4	China	21.1
Mexico	10.7	United States	20.3
Hong Kong, China	8.4	Hong Kong, China	11.9
European Union (15)	4.7	European Union (15)	7.6
Dominican Republic	4.5	India	5.4
Taipei, Chinese	4.5	Korea, Republic of	4.2
Indonesia	3.6	Taipei, Chinese	3.2
Honduras	3.4	Indonesia	2.6
Philippines	3.4	Bangladesh	2.5
India	3.2	Thailand	2.3
C. *European Union (15)*		D. *Japan*	
European Union (15)	41.6	China	62.7
China	8.3	European Union (15)	12.4
Turkey	6.1	Korea, Republic of	5.2
Hong Kong, China	5.6	United States	4.5
Tunisia	3.1	Vietnam	2.9
India	2.9	Thailand	2.5
Morocco	2.8	Indonesia	2.0
Poland	2.5	Hong Kong, China	1.6
Romania	2.2	Taipei, Chinese	1.4
Bangladesh	2.1	Philippines	1.0
		Malaysia	0.9
		Korea, Democratic People's Republic	0.6
		India	0.6

Source: Data compiled from WTO, Annual Report 1998.

Textiles (i.e., STA and LTA). LTA was to expire in December 1973 after its successive renewals, but fearing imminent threats from the low cost textile and clothing exports from the developing countries, developed countries evolved a newer arrangement-called the Multi Fibre Arrangement Regarding International Trade in Textiles (MFA). The arrangement came into force from January 1, 1974. While the earlier two arrangements covered only the cotton textiles and clothing, the later brought under its ambit not only the cotton but also the

Clothing exports from the developing countries have for a long time been subject to quantitative restrictions.

non-cotton textiles and clothing exports from the developing countries (for further discussion, see Jain 1986). However, persistent protests from the developing countries, developed countries eventually agreed to phase out quota restrictions on textile and clothing exports from the developing countries. Consequently, a new agreement – called Agreement on Textiles and Clothing (ATC) – was evolved in 1995 under the auspices of the Uruguay Round of Multilateral Trade Negotiations [see WTO, 1996]. The four stage phase-out process (integrating textiles and garments under WTO rules on 1st January of 1995, 1998, 2000 and 2005) has already begun; and, if the things move as per the provisions of the agreement, world trade in clothing shall become completely quota free by January 1, 2005. That being the case, the developing countries would no longer be constrained to export only upto quota limits. They would rather be free to export as much as they are capable of exporting.

The real gains from trade liberalization, however, are likely to accrue only to those select clothing exporting countries which are highly competitive and are already well established in the markets of the developed world. The other clothing exporting countries which are not much competitive and exist only as marginal players on the world garment trading map might be hit hard (Jain 1997). The assured market access that these countries have enjoyed so far due to imposition of quota restrictions on the dominant garment suppliers such as Hong Kong, South Korea, Taiwan and Macao would disappear. Unless the other less dominant clothing exporting countries take timely steps to augment their competitiveness, they might even losses whatever marginal shares they are presently holding in the world garment markets.

In such a scenario, it is but natural for one to get concerned with the ability of the Indian garment export firms to survive future market competition and emerge as an important player in the world markets. The present paper reports the findings of the survey that was carried out by the author to delve into the competitiveness of the Indian export firms and assesses their prospects of emerging as major clothing suppliers in the world clothing markets in future. The paper first provides an overview of the research design and methodology used in the study, and it then analyses findings of the survey. Suggestions for improving competitiveness of Indian clothing export firms have been made in the concluding section.

Competitiveness Construct

Competitiveness of a country's exports in the past has by and large been examined in terms of price competitiveness of the country's export products. This preoccupation with pricing aspect – though a dominant and reoccurring theme in the economic literature – is theoretically unsound and also suffers from a number of methodological drawbacks. First, most of the price competitiveness studies involve a comparison of the export unit values which are obtained by dividing the total value of a country's exports by the total quantity of its exports of a given product. Explicitly or implicitly, it is assumed that products exported from different countries are similar in quality and other features. This, however, is rarely the case especially in the case of manufacturers coming from different countries. These product variations across the nations, and even across the firms from a given nation, substantially affect the validity of the unit price comparisons.

Competitiveness of a country's exports in the past has by and large been examined in terms of price competitiveness of the country's export products.

Secondly, price constitutes but only one of the components of a country's export competitiveness, and hence any comparison of the price provides only a partial picture of the competitiveness phenomenon. For arriving at any meaningful interferences, it is imperative to consider influence of non-price factors also such as quality, size, packaging, color, design, adherence to delivery schedules and promotion. These are equally important determinants of export competitiveness and exert considerable influence on the buyer's perceptions and purchase decisions. Marketing literature is replete with evidences to suggest that it is 'value for money' rather than simply the 'price of a product' which affects customer's decision to buy a particular product. This is especially true of the buyers from the developed countries who are affluent enough and do not mind paying a little extra provided the products are of good quality and are timely delivered to them.

In view of the shortcomings of the economist's traditional approach to competitiveness, the analysis in the present paper makes use of a broader concept of competitiveness and examines influence of price as well as non-price factors on a country's export competitiveness. Another noteworthy feature of the study is that it uses perceptual data, i.e., primary data, collected through a field survey of Indian garment export firms. This constitutes a significant departure from the erstwhile studies which have primarily been based on the secondary data collected from the international trade yearbooks and journals.

Survey Design

A structured non-disguised questionnaire has been developed for collecting the necessary attitudinal data. Based on the literature review (see, for instance, Jain 1986; Khanna 1994; Nair 1994; Koshy 1995) and the author's own understanding of the subject, two sets of statements were generated. The first set of statements pertained to respondents' perceptions of the overall ability of the export firms to withstand imminent competition in the garment markets. It also included a few questions to assess the likely impact of select price and non-price factors on the export competitiveness. The second set of statements sought to directly ascertain the respondents' perceptions about the non-price competitiveness of the Indian clothing export firms. Five-point Likert scale, ranging from '1' (strongly disagree) to '5' (strongly agree), was employed to measure the respondents' level of agreement/disagreement with the given statements.

The draft questionnaire was pre-tested in January-February, 1996. Based on the comments received during the pre-testing stage, suitable modifications were made in the questionnaire so as to make it usable in the final study. While the statements relating to the first set of statements are given in Table 3, various items constituting the non-price based competitiveness construct along with the scale used to measure respondents' perceptions are given in Appendix-I.

The final survey was carried out in June-August, 1996. Chief executive officers (namely the chairman, managing director or export manager) or senior persons well conversant with the garment export operations of the firms constituted the respondents. A few consultants, experts and senior officers of the Apparel Export Promotion Council (AEPC) and association of the garment manufacturing firms were also approached to seek their opinions on the subject. Using convenience sampling method, a total of 150 firms and experts based in Delhi were personally contacted and were delivered the questionnaire. Despite repeated call backs, however, only 79 filled-in questionnaires were received back; and of these only 72 were found suitable for use in the study

Mean response scores for each of the statements in the questionnaire were computed. T-test was applied to ascertain whether the computed mean scores differed significantly from '3' – representing a position of 'indifference' on the five-point Likert scale. Factor analysis was used to identify the major non-price dimensions underlying the export competitiveness of the Indian firms. Major findings of the survey are discussed in the following section.

Table 3: Ability of Indian Garment Export Firms to Compete in Quota Free Market

	Statement	Mean[1,2]
	Perception about Other Firms/Exporters	
(a)	Indian exporters will not be able to compete in a free market after phasing out of the MFA.	2.34*
(b)	Indian firms will not be able to compete in a quota free world market due to lower quality of their products.	2.68*
(c)	After phasing out of MFA, Indian exports will dramatically increase due to price competitiveness.	3.20 (ns)
(d)	After removal of MFA restrictions on garment exports, India will lose its garment exports to other countries due to its low productivity.	3.10 (ns)
	Perception about Respondents' Own Firms	
(a)	Our firm is competitive enough to withstand the competitiveness and challenges as arising out of phasing out of MFA.	4.22*

Notes: 1. Responses obtained on a five-point scale where 1 = Strongly disagree and 5 = Strongly agree.

2. Mean scores that significantly differ from 3 (indifferent) are shown by asterisk mark (*).

Significant levels are:

* $p < .000$

** $p < .03$

ns - not significant

Results

Table 3 presents the results relating to the first set of questions asked to ascertain their views about the overall perceived competitive ability of the Indian garment export firms and about the influence of the select factors on the perceived competitiveness. A mean score of 2.34 shows respondents' disagreement to the statement that Indian garment export firms will not be able to compete in a free market. Lower product quality in the opinion of the respondents for the survey is not expected to be a deterrent to the firms' abilities to compete in the quota free markets in future. The respondents, however, appear uncertain in respect of prices of Indian products and productivity to be exerting any impact on the competitiveness of Indian export firms in a quota free trade regime.

When questioned about the competitiveness of their own firms, respondents expressed a high degree of confidence in their ability to withstand emerging competition after the phasing out of MFA restrictions on clothing exports. A highly significant mean score of 4.22 is a pointer to the fact.

A second set of questions which were put to the respondents to gain insights into the non-price competi-

tiveness of the surveyed firms. Since competitiveness is a relative term, a comparative rating method was employed to elicit the necessary attitudinal information from the respondents. As already mentioned in the preceding section, ten items tapping the non-price competitiveness construct along with the scale used in this connection are given in Appendix-I.

Factor analysis using principal component method and varimax rotation was employed to identify the dimensions underlying country's non-price export competitiveness. Suitability of the data for factor analysis was assessed by applying Barlett test of sphericity ($p = 0.000$) and Kaiser-Meyer-Olkin measure of sampling adequacy ($KMO = 0.638$).

The results of factor analysis are presented in Table 4. Four factors having eigen values of greater than 1 were extracted, and these accounted for 70.8 per cent of the total variation in the response scores. Based on the configuration of factor loadings, the four factors were respectively named as dependability, expansion capability and resourcefulness, technology and production capacity and promotion efforts.

Alongside the extracted factors and their factor loadings, Table 4 shows mean scores for each of the items constituting different competitiveness dimensions. A perusal of the data reveals low competitiveness of the Indian clothing export firms in respect of all the four identified factors. In respect of first factor, viz., dependability, Indian firms cannot be considered dependable because of poor delivery schedules and no clear opinion to be existing among the respondents about the firms' product quality and image in the world markets. The item 'quality' of the dependability dimension needs further discussion as the mean scores in respect of this item in Tables 3 and 4 present somewhat different pictures. While a mean score of 2.68 in Table 3 imply that the respondents are sure that the quality of Indian products is not poor to be adversely affecting Indian firms' ability to compete in the quota free markets; a score of 3.04 in this respect in Table 4 imply uncertainity in the mind of the respondents' about the quality of Indian garments, i.e., respondents are not sure whether the quality of Indian garments, i.e., respondents are not sure whether the quality of Indian products is not poor to be affecting India's competitive ability, then why they turn out to be ambivalent in respect of quality item in Table 4.

If the two statements are closely examined one find that contradiction is more apparent than real. What the two scores imply is that though quality is not too bad to adversely affect the competitiveness of Indian firms, it is at the same time not perceived by the respondents to be high enough in relative terms to provide Indian firms

Table 4: Perceived Non-Price Competitiveness of Indian Garment Export Firms vis-a-vis Garment Exporters from Other Countries: Factor Analysis and Mean Scores

Competitiveness dimension	Mean[1,2]	Factor 1	Factor 2	Factor 3	Factor 4
Dependability,					
Poor in adherence to delivery schedules	3.49*	–0.83			
Supply of high quality products	3.04 (ns)	–0.74			
Holding poor image in world markets	3.17 (ns)	–0.61			
Expansion capability and resourcefulness					
Well equipped to expand production capacity	3.85*		–0.70		
Advantage in obtaining raw material from local sources	3.19 (ns)		–0.60		
Technology and production capacity					
Having latest technology and machinery	2.90 (ns)			0.74	
Having sufficient production capacity	3.37*			–0.61	
Promotion efforts					
Wide promotion of products	2.90 (ns)				0.64
Lower participation in trade fairs and exhibitions	3.46*				0.53

Notes: 1. Responses were obtained on a five-point scale where 1 = Strongly disagree and 5 = Strongly agree.

2. Mean scores that are significantly different from 3 (indifferent) are shown by asterisk (*) mark.

Significance levels are:

* $p < .005$

ns - not significant.

a competitive edge over their competitors from other countries.

Coming to the second factor, viz., *expansion capability and resourcefulness*, it is found that though Indian clothing export firms appear well equipped to expand the production capacities in future, they do not conspicuously hold any distinct advantage in obtaining raw materials from local sources.

So far as the technology and production capacity factor is concerned, the Indian garment firms no doubt have sufficient production capacity, but they cannot be considered better than their counterpart in possessing

latest technology and machinery. Results turn out to be utterly poor in respect of *promotion efforts*. While the respondents appear ambivalent in regard to Indian products being products being widely promoted in the overseas markets, they do feel concerned with lower participation of Indian firms in the trade fairs and exhibitions (see Table 4).

Concluding Observations and Suggestions

Analysis of the survey results in the paper reveals that Indian firms are not scared of competing in the quota free markets. The firms rather appear confident that India's exports would be much higher once the quota restrictions are phased out. A similar optimism prevails among the respondents about the capabilities of their own firms to expand garment exports in future. Though the respondents appear somewhat ambivalent in their opinion about the country's price competitiveness leading to larger garment exports in the coming years, Indian firms on a comparative basis are by and large found to be deficient in respect of all the four non-price export competitiveness factors. Be it product quality, delivery schedules, production technology and machinery or export promotion efforts, Indian firms are lacking in respect of all of them.

The firms rather appear confident that India's exports would be much higher once the quota restrictions are phased out.

After demolition of quotas in future, world trade in clothing is likely to become very competitive. In view of the lack of competitiveness as revealed by analysis in the present study, Indian firms need to urgently initiate steps to revamp their export competitiveness to be able to withstand emerging market challenges and expand their garment exports. A few suggestions in this regard are as follows.

Presence of quota restrictions on garment exports has created market conditions similar to those of the sellers' market. With the removal of these restrictions, garment markets would soon be turned into buyers' markets. In such a scenario, *'marketing'* rather than *'selling'* or *'export quota procuring'* approach will be the key to success. Since overseas buyers in future would be free to procure supplies from any source of their choice, Indian export firms need to give utmost attention to improving their image as suppliers of high *quality clothing*. It is worth mentioning in this context the remarks made by Jack Robinson, First Secretary (Economics), Embassy of the United States of America:

> *"I recall visiting a small retailer in the U.S. He had a basket of half price shirts. I sorted through the pile—they came from Sri Lanka, Oman, Nepal, The United Arab Emirates and India. One shirt from Sri Lanka had a sleeve 6 inches longer than the other sleeve. Similar problems afflicted the other shirts. I would venture to say that the exporters of those goods did not receive any follow-up orders from their American importer. And they certainly would not receive highly lucrative orders to re- supply lines of clothing which were selling well."*

Closer rapport with the distribution channels is equally imperative. Large firms can try setting up their own distribution outlets in foreign markets so as to come closer to the ultimate consumers (Jain 1999). Joint ventures and tie-ups with foreign firms can be helpful in gaining access to world markets and improving export competitiveness.

Easier access to international sources of raw materials can be helpful to firms in improving product quality and bringing down their production costs. While firms from other countries use latest technology and modern machines, many a garment manufacturer in India continue to make use of the out-dated machines and technology. Production technology needs to be upgraded to be at par with that of competitors (for further discussion on this aspect, see Aryagary 1996). With quota restrictions gone in the liberalized trade regime, buyers are expected to start placing large size orders. Indian firms need to expand their production capacities to be able to execute big orders.

Easier access to international sources of raw materials can be helpful to firms in improving product quality and bringing down their production costs.

Export promotion in India has from the very beginning remained a neglected front. Because of quota restrictions, Indian firms have not been required to do much of promotion. Foreign buyers on their own have been approaching Indian suppliers to meet their requirements from the Indian quota. But this would be no longer true in future. Being free to import from any source in the quota-free regime and world clothing markets turning into buyer's markets in the near future, Indian export firms would have to start aggressively promoting their products in foreign markets. Apart from

advertising and personal selling of their products, Indian firms need to actively participate in the international trade fairs and exhibitions. This would immensely help them in coming closer to the overseas buyers and building a good image in the world clothing markets.

Opinion of most of the respondents in the survey has been that a large chunk of clothing is not exported under the exporters' own brand names. This does not augur well for the Indian firms. Not only does it lead to poor unit value realisations, but it also results in no recognition of Indian firms in the world markets. A time has come for the Indian firms to start making investments in launching their own brands in the export markets. They should also endeavor to develop market niches for their products to be able to realize higher export unit values. Activation of the India Brand Equity Fund that was recently set up by the government can be of great help in this regard (Bhattacharya 1996). Firms should start exploring as to how they can make use of the assistance available under this scheme.

Before coming to an end, it would not be out of place to mention a few caveats. The analysis in the study is based on responses received from a convenience sample of 72 Delhi based clothing export firms which cannot be considered to be truly representative of the entire population of Indian clothing export firms. The findings of the study, therefore, need to be used cautiously. These at best can be construed as describing perceptions of the surveyed firms. Any sweeping generalization about the export competitiveness of the entire universe of Indian clothing export firms would seem unwarranted.

The study being an explorative one has made of use only a select list of items tapping export competitiveness of the firms. Moreover, single-item rather than multi-item scales have been used to investigate the problem. Larger and more elaborate studies encompassing a greater number of competitiveness dimensions and use of multi-item scales are called for in future to improve the reliability and validity of such analyses and to constructively make use of them in drawing inferences for the firm as well as the country level export marketing strategies.

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Appendix-I

Competitiveness Scale Used in the Study

The respondents were asked to tick the appropriate alternative for each of the following statements relating to the strength of Indian clothing export firms in the world clothing export markets.

In comparison to garment exporters from other countries, Indian garment exporters:

(a)	Hold poor image in world market	SA	A	I	D	SD
(b)	Are poor in adhering to delivery schedules	SA	A	I	D	SD
(c)	Have lower participation in trade fairs and exhibitions	SA	A	I	D	SD
(d)	Widely promote their products	SA	A	I	D	SD
(e)	Supply high quality products	SA	A	I	D	SD
(f)	Have sufficient production capacity	SA	A	I	D	SD
(g)	Enjoy advantages in obtaining raw materials from local sources	SA	A	I	D	SD
(h)	Have latest technology and machinery	SA	A	I	D	SD
(i)	Are well equipped to expand production capacities	SA	A	I	D	SD

□

requirements to product design (technical specifications); product design to process planning; and process planning to process control or control planning. QFD differs from many other forms of customer input (e.g. customer surveys) in that it identifies what the end user wants in his/her own "language".

There are several benefits of the QFD process. Most importantly, the QFD process helps define products and services that meet customer needs. In addition, it provides a prioritized list of user and technical requirements, which have been obtained from the output of the process. Other benefits include better defined requirements; better understanding of solutions that need to be implemented; clearer assignments of action items; help in identifying areas where no good solutions exist. although QFD's benefits far outweigh some of its limitations, one may not ignore addressing some of its problems. The biggest limitation of the QFD process is that once customers define their requirements, they often become easily dissatisfied when non-expressed "expected" requirements are not found in their final product. "Expected" requirements that customers often neglect to ask for because they could not imagine a product without them are usually termed "dissatisfiers". Another limitation of the QFD process is that some product characteristics are outside of a customer's scope of thinking when initial requirements are defined. However, when these new exciting features, frequently termed "delighters", are developed users begin to expect these features in all products and applications.

The biggest limitation of the QFD process is that once customers define their requirements, they often become easily dissatisfied when non-expressed "expected" requirements are not found in their final product.

The overall goal of the QFD process is to solicit requirements which customers are aware they need. When soliciting requirements, an attempt must be made to address and answer following compounded question: What does the customer require (not, how to do it) and why does the customer have this requirement?

Activity-Based Costing Concept

Since the early 1980's General Dynamics, McDonnell Douglas, Westinghouse, General Motors, Lockheed and major public accounting firms have supported the activity-based costing (ABC) accounting approach to costing. The fundamentals of activity based costing can best be described as follows (Douglas 2, 1992, p. 33):

> "Activity-based costing concept is based on the premise that products require an organisation to perform activities and that those activities require an organisation to incur costs. In activity-based costing, systems are designed so that any costs that cannot be attributed directly to a product flow into the activities that make them necessary and that the cost of each activity then flows to the product(s) that make the activity necessary based on their respective consumption of that activity."

Activity in above statement refers to any process or procedure that results in "work" or "activity". In a manufacturing or service environment some of these activities for a software development company using QFD are very distinct and can be measured as is outlined in what follows.

QFD System for Software Development

The four phases of activities for QFD (Wu, 1998) are: product planning, product design, process planning and control planning. The phases for each product can be costed accurately through evaluation of their activities. These activities for a software company are as follows:

The ***Product Planning Activity*** takes customer requirements and turns them into technical specifications. The best method to use in identifying specific customer needs is through brainstorming or group discussion. However, brainstorming combined with group discussion, after individual ideas have been generated, allows the exploration of viable solutions and options. Now customer requirements are discussed and prioritized. For example, as it applies to a software development company, numeric values could be assigned to customer requirements in order to determine the user priority of each requirement, a value ranging from 1 (unimportant) to 5 (very important) is assigned in each of three categories. These categories are user priority (reflecting how critical the requirement is to the customer segment voting on it), current level (reflecting how well the requirements is currently supported in the

The best method to use in identifying specific customer needs is through brainstorming or group discussion.

company), and desired level (reflecting where the company wants to be). This is shown in the Table below:

User Requirements	User Priority	Currently Level	Desired Level
Unique and Common System	5	1	5
System Flexibility	5	1	3
Ease of Use	4	1	3
Statistics	4	1	3
Accurate Customer History	4	3	4
Accurate Problem Reproduction	5	3	4
Better Defined System	4	2	3
Problem Tracking	4	2	3
Reducing Cycle Time	3	2	3
Problem Version Control	4	3	3

An "improvement ratio" can how be calculated by dividing the desired level by the current level. this ratio indicates the level of improvement needed to get from the current status to the company's desired level in order to satisfy the customer's need. In addition, each user requirement is assigned a "Sales Point" value. This is used to value requirements, which will supply a competitive edge. King (1989), suggests the following scale: 1 for an unimpressive or neutral sales value 1.2 for a minor sales value, and 1.5 for a major sales value. For our example data this yields the following table below:

User Requirements	Improved Ratio	Sales Point	Weighted Request
Unique and Common System	5	1.5	37.5
System Flexibility	3	1.2	18
Ease of Use	3	1.2	14.4
Statistics	3	1.2	14.4
Accurate Customer History	3	1.2	9.6
Accurate Problem Reproduction	1.33	1.2	8
Better Defined System	1.5	1.2	7.2
Problem Tracking	1.5	1	6
Reducing Cycle Time	1.5	1	4.5
Problem Version Control	1	1	4

The next step is to determine the final weighted value of each requirement. This is depicted as the last column in the above table. For computing weights the user priority is multiplied with the improvement ratio and sales value does this. A Pareto chart (bar chart) can prove very useful to help graphically illustrate the ranking of user requirements. Technical solutions that match each requirement also go through a series of similar computations, until they are prioritized.

Finally, a master table is prepared which cross-references the user requirements with the proposed solutions in terms of technical characteristics. In QFD terms, this is known as the A-1 matrix, or the "House of Quality" for the product planning phase.

In the ***Product Design Activity*** technical requirements that were developed in the previous phase are turned into part characteristics. This is done by using the house of quality method, where the "What's" are the technical requirements and the "How's" are the part characteristics which are going to be derived. This assures that the voice of the customer has been rolled down to the design of part characteristics.

Then a ***Process Planning Activity*** takes the part characteristics developed in the previous phase and determines the process which best produce the part. Again using the house of quality method does this. Since the voice of the customer has been rolled down from phase one to phase two and from phase two to phase three, it is also part of the process-planning phase. Finally ***Control Planning Activity*** involves taking the process planning characteristics necessary to produce a product as identified in the previous phase and determines what process control methods will be necessary in production to produce the part the customer expects. This control activity is a formal means of providing feedback from the beginning stages of the QFD process through the development cycle of the product or service. Without any formal mechanism for feedback, the overall purpose of the QFD system of meeting customer requirements would be impossible to verify.

Control planning activity is a formal means of providing feedback from the beginning stages of the QFD process through the development cycle of the product or service.

QFD and ABC Accounting

With the advent of QFD systems, several companies have seen dramatic changes in their managerial accounting departments. One such change that has taken place in accounting systems within companies using QFD is the conversion in costing from a "product basis"

to a "cost basis". Before QFD was implemented in US product development companies most costing was done on a product basis. The reasoning behind this was mainly due to the fact that all products under development were estimated as a whole, based on the cost of previous projects of similar size. Data was not retained with reference to the total number of hours that had been spent on individual tasks or activities. Only the beginning and ending dates of the entire projects were kept for reference. Once QFD was adopted many product development companies started keeping track of the number of hours spent on individual parts of the product development cycle. One of the largest parts of the product development process is "requirements analysis". Because QFD plays a large role in this phase of the product development cycle, costs can be assigned to the resources, and total project costs can be better estimated. Thus, the overall cost system at these companies changed from a product-based system to an activity based one.

By tracking the individual activities or phases of the product development cycle and assigning costs to them, it is easy to see how companies can move toward an "activity based" (ABC) cost accounting system. This leads to many positive changes in these companies. First, it has given companies the capability to effectively predict future costs. Second, it enables management to find cost elements that have large deviations, and, if need be, to eliminate them. Third, communications increase between the accounting department and the research and development/engineering departments.

Activity based costing, as a result of using the QFD system, has changed the entire way budgets are produced. Now, engineering cost centers and even submanagerial groups are organised by activities. Entire groups of engineers may report to one cost center director at the beginning of the year and end up reporting to another director by the end of the following quarter. Structural reorganisation occurs based on changing client requirements that are to be reflected in the product that is being developed. Now workers in engineering departments must fill out time cards declaring how much time is spend per day on a variety of on-going departmental projects. These time cards prove to be extremely beneficial in collecting data used to determine product capitalization, in forecasting expected dates of project completion and in budgeting for similar projects based on individual components.

The migration to an activity based cost system helps lead companies to better decision making because they can now trace indirect cots more accurately while additionally directing management to focus attention to the causes of cost variations. Years ago, manufacturers produced relatively small numbers of very similar products and labour was the main element in a firm's cost structure. Today, products are more numerous, unique, and vary in their production requirements and labour has become a much smaller component of the total production cost. All of these factors contribute to forcing manufacturers to take a closer look at their traditional volume-based costing systems and consider moving toward a transaction based or activity based costing system.

Concluding Remarks

Activity-based cost accounting (ABC) is different from the traditional cost accounting in that it is based on the notion that cost often cannot be accurately traced using a single activity driver or even several activity drivers if all of them are based on volume (i.e. direct labour hours, machine hours, or units). More accurate costs can be obtained when a cost is associated with an activity and is not driven by the volume. ABC also provides benefits by influencing the behaviour of key individuals and items such as design engineers, production managers, and marketing strategies. A well designed ABC system provides managers with a better understanding of how profits are generated at both the product and the customer level (King 4, 1991).

The adaptation of QFD by companies will change accounting's costing systems and additionally force managerial accountants to be more "customer focussed". It will help them to decrease the time it takes to prepare pertinent reports, as well as increase their efficiency and level of quality. Today, managerial accounting departments within companies using QFD are usually activity based and emphasize the concept of Total Quality Management (TQM).

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Feature

A Statistical Analysis of Central Sector Projects in India

P.K. De

Massive cost overruns and long gestation periods are matters of great concern in implementing the central sector projects in India. The present paper makes a statistical analysis of the relationship between the project parameters and cost overruns incurred by central sector projects. The present scenario of project delays and cost overruns are critically examined. Finally, suggestions to improve on the existing project management practices in handling central sector projects are given.

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Introduction

The principal aim of the paper is to make a statistical analysis of the relationship between the project parameters and cost overruns incurred by central sector projects in India. The base data for the analysis has been taken from the 1997-98 Annual Report of the Department of Programme Implementation, Ministry of Planning & Programme Implementation, Government of India (Government of India, 1998). In all the 454 projects, which were being monitored by the Project Monitoring Division of the Department of Programme Implementation (DPI) during 1997-98 are considered. Correlation coefficients have been obtained between gestation period and cost overrun on one hand, and initial cost of the project and cost overrun on the other. The paper also examines the present scenario of project delays and cost overruns. Finally several suggestions are made to improve on the existing project management practices in handling central sector prcjects.

Projects Monitoring

All central sector projects costing Rs. 20 crores and above are monitored by the Project Monitoring Division of the Department of Programme Implementation; this was set up in 1985 as an apex-level central monitoring agency for the implementation of the central sector projects. Projects are categorized into three different groups based on their outlays. Projects costing between Rs. 20 crores and Rs. 100 crores are marked as medium projects. A project costing between Rs. 100 crores and Rs. 1000 crores is termed as a major project. Projects costing above Rs. 1000 crores are known as mega projects. During 1997-98, there were 226 medium projects, 185 major projects and 43 mega projects.

A two-tier method of project monitoring is adopted. While all projects are monitored on a quarterly basis, major and mega projects are monitored every month.

Projects records are computerized with the help of National Informatics Centre (NIC). Various projects monitoring reports are prepared by DPI giving all possible reasons for time overruns and cost overruns. A "Summary Flash Report" is sent to the Prime Minister's Office, Cabinet Secretariat and the concerned Ministries/Departments. Some of the other reports are "Action Taken Reports", "Exception Report", Index of Classified Problems, and "Quarterly Project Implementation Status Reports (QPISR)".

A two-tier method of project monitoring is adopted. While all projects are monitored on a quarterly basis, major and mega projects are monitored every month.

In spite of all these monitoring measures, it is noted that there is a total project overrun of Rs. 21,603 crores for the 454 projects as per the 1997-98 Annual Report. Project costs have escalated from the "latest approved cost" of Rs. 146,169 crores to Rs. 167,772 crores. The cost overrun would be 38.9 percent if the original cost of Rs. 120,769 crores is considered for the 454 projects. This is too heavy a wastage on national exchequer. Gopalakrishnan and Ramamoorthy (1993) also expressed a similar concern while analysing central sector projects. Investments of such large magnitude with time overrun result in budgetary deficits and retard the nation's economic growth. By demanding continuous financial support from the government for meeting the cost overruns, the national planning process is hindered.

Overview of the Projects

Some basic information on the 454 projects is given in Table 1. The sectoral distribution of projects with number of mega, major and medium projects in each sector is shown in Figs. 1-4. The corresponding escalated project costs of mega, major and medium projects of different sectors are shown in Figs. 5-8. Though the maximum number of projects is in the railways sector, capital-intensive projects are in the power sector. The cost overrun of the projects in each sector is shown in Fig. 9. It is observed that the maximum cost overrun is for power sector projects, followed by the projects of railways and steel sectors.

It has been indicated by DPI that the criterion of time overrun has not been considered in the Annual Report because of the practical difficulties faced in the absence of original date of completion of projects. The cost overrun of Rs. 21,603 crores (with reference to the latest approved cost and present anticipated cost) is accounted for by 171 delayed projects. Some examples of projects with long gestation period and high cost overrun are shown in Table 2.

Table 1: Types of Central Sectors Projects

	Number of Projects	Anticipated Project Cost (Rs. Crores)	Percentage of Total Cost (Rs. Crores)
Mega Projects	43	99833	59
Major Projects	185	58155	35
Medium Projects	226	9784	6
Total	454	167772	100

Source: Annual Report, Department of Programme Implementation, Government of India, 1997-98, p. 25.

Table 2: Projects with Long Gestation Period and High Cost Overrun

Project	Sector	Anticipated Gestation Period	Percentage Cost Overrun
Howrah-Amta Champadanga New Line	Railways	28 Years	459
Calcutta Underground Railway	Railways	24 Years 11 Months	994
Bagaha Chittauni	Railways	22 Years 8 Months	2640
Satgram U	Coal	19 Years 10 Months	691
Dulhasti HEP	Power	15 Years 8 Months	1266

Source: Annual Report, Department of Programme Implementation, Government of India, 1995-96, p. 63.

Out of 69 projects completed during 1996-97, 21 projects were completed within approved time schedule and 48 projects were completed with time overruns. It was observed that, out of these 48 projects there were 9 projects that had reported time overruns between 50% and 100 per cent and 11 projects with time overruns beyond 100 per cent. It has been that, as on 30 December, 1997, there were 109 projects on the monitoring system without a firm date of commissioning.

The report also states that, in 1997-98, 45 projects have been dropped or frozen without completion on account of reprioritization or other reasons. This consists of 14 telecommunications sector projects, 13 railway projects, 11 coal sector projects, 2 petroleum sector projects and one project each in mines, petrochemicals, power, surface transport and heavy industry sectors.

Statistical Analysis

A statistical analysis of the relationship between

Fig.1 Sectoral Distribution of Mega Projects

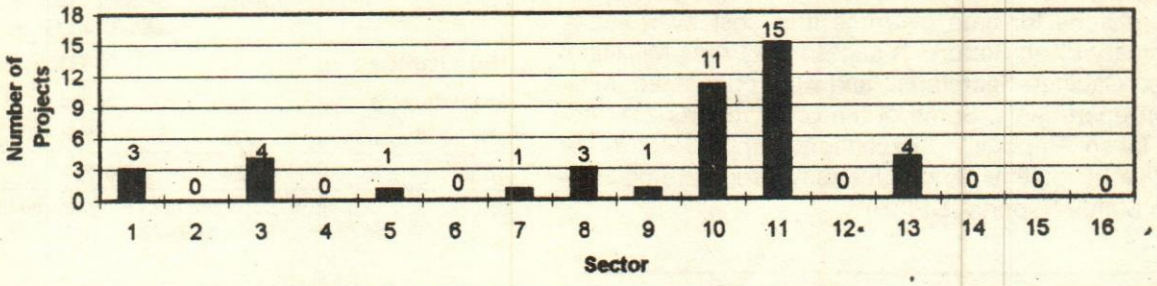


Fig. 2 Sectoral Distribution of Major Projects

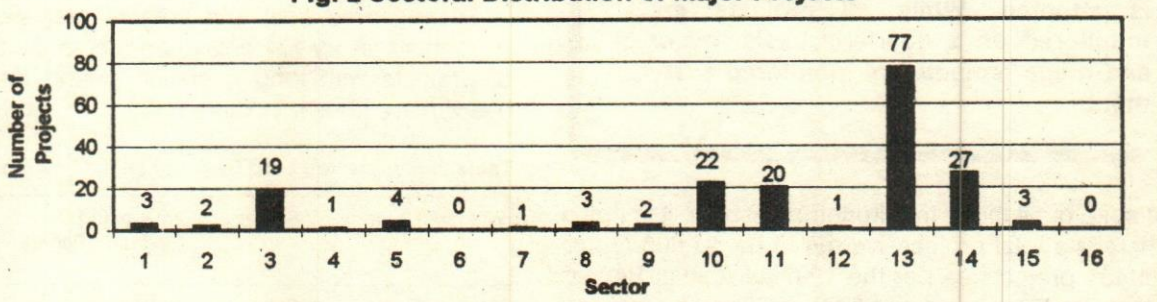


Fig. 3 Sectoral Distribution of Medium Projects

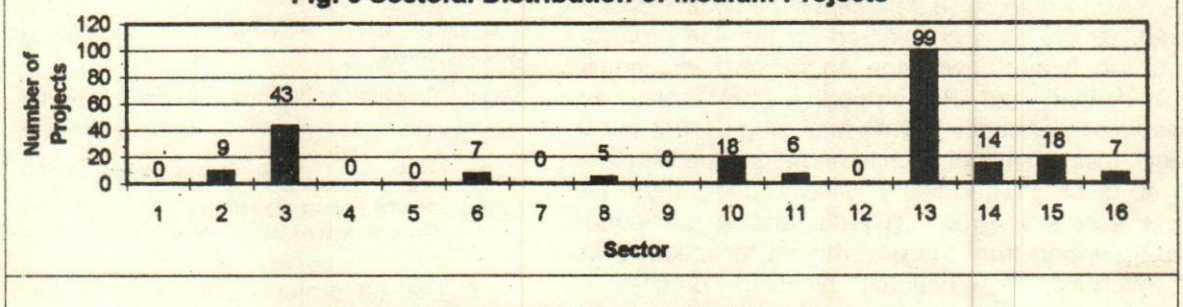
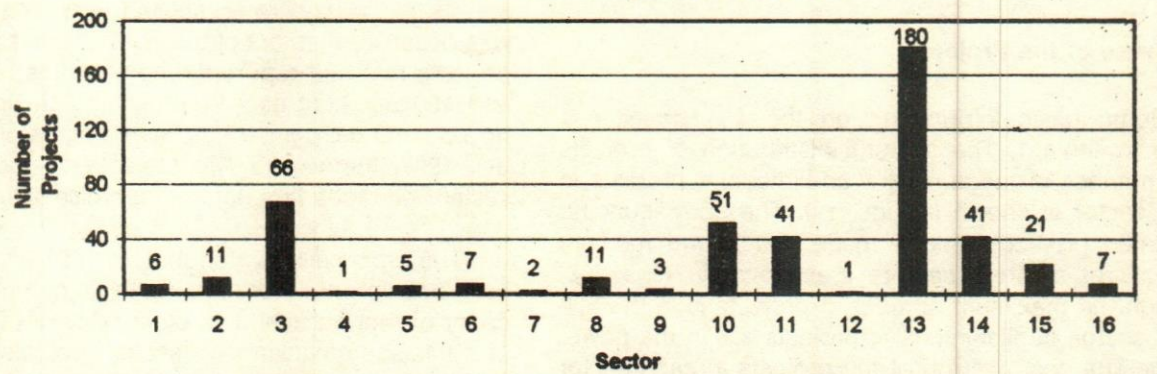


Fig. 4 Sectoral Distribution of all Projects



Legend for sectors:

1. Atomic Energy	2. Civil Aviation	3. Coal	4. Finance
5. Fertilisers	6. Info. & Broadcasting	7. Mines	8. Steel
9. Petrochemicals	10. Petroleum	11. Power	12. Heavy Industry
13. Railways	14. Surf. Trans.	15. Telecom.	16. Others

Fig. 5. Cost of Mega Projects

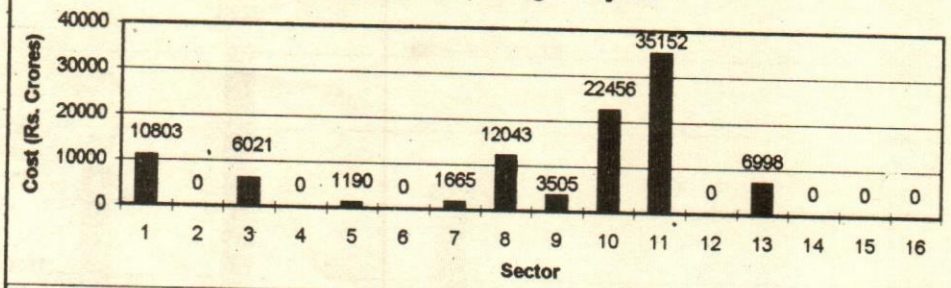


Fig. 6. Cost of Major Projects

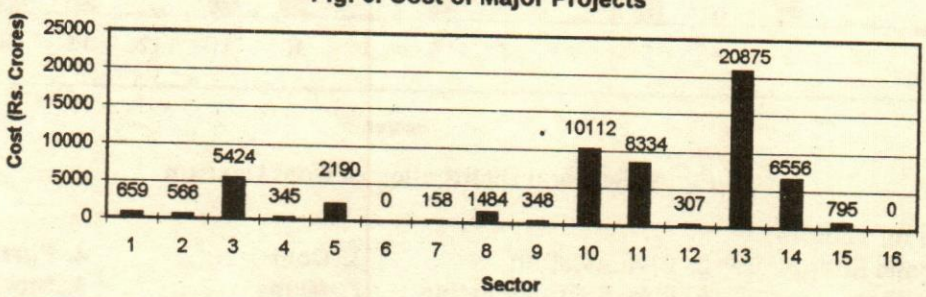


Fig. 7. Cost of Medium Projects

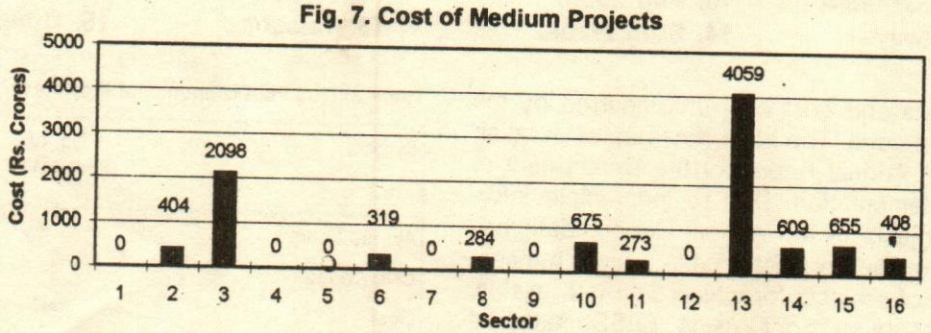
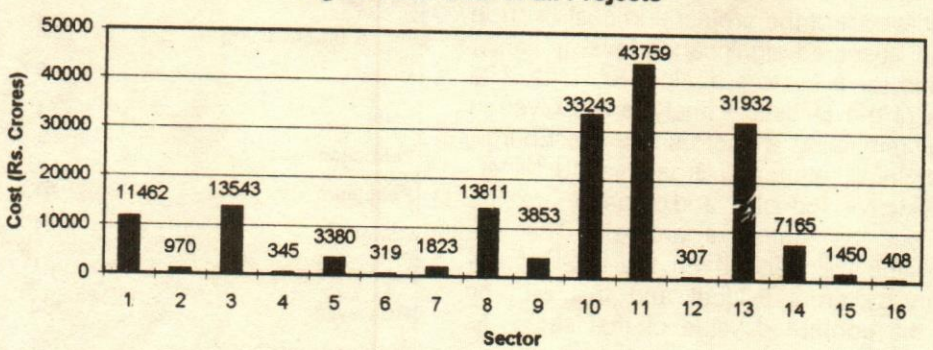


Fig. 8. Total Cost of all Projects



Legend for sectors:

1. Atomic Energy	2. Civil Aviation	3. Coal	4. Finance
5. Fertilisers	6. Info. & Broadcasting	7. Mines	8. Steel
9. Petrochemicals	10. Petroleum	11. Power	12. Heavy Industry
13. Railways	14. Surf. Trans.	15. Telecom.	16. Others

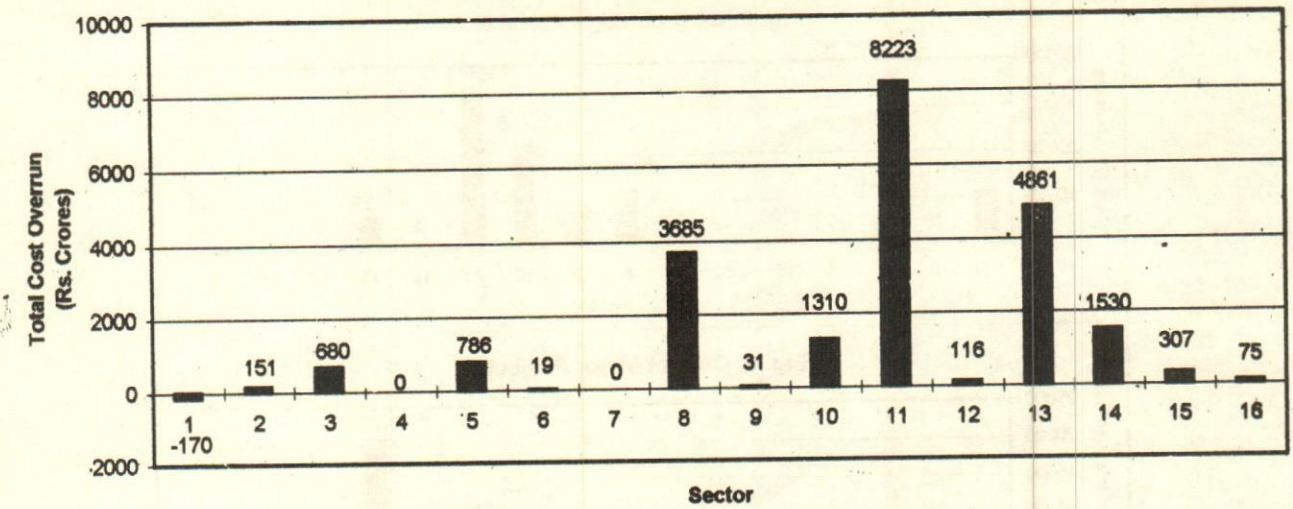


Fig. 9. Sectoral Distribution of Cost Overrun

Legend for sectors:

1. Atomic Energy	**2. Civil Aviation**	**3. Coal**	**4. Finance**
5. Fertilisers	**6. Info. & Broadcasting**	**7. Mines**	**8. Steel**
9. Petrochemicals	**10. Petroleum**	**11. Power**	**12. Heavy Industry**
13. Railways	**14. Surf. Trans.**	**15. Telecom.**	**16. Others**

project parameters and cost overruns incurred by the projects has been done. The base data has been taken from the 1997-98 Annual Report of the Department of Programme Implementation. Due to incomplete information of 98 projects in the Annual Report, data has been taken for only 356 projects. Table 3 gives the sectoral distribution of projects for which data is available. The analysis has been done using SPSS statistical software. Correlation coefficients have been obtained between the gestation period and cost overrun on one hand, and the initial cost of the project and cost overrun on the other. The observed significance level (p-value) has been obtained for 8 sectors against R^2-value. The summary results of the statistical analysis are given in Table 4. Data for remaining 8 sectors (Atomic Energy, Finance, Fertilizer, Information and Broadcasting, Mines, Petrochemicals, Heavy Industry and others) are too small to carry out the statistical analysis. The significance of R^2-value will depend on the level of significance chosen by an individual and this can be compared with the computed value of that sector as given in table 4.

From the R^2 values given in Table 4, it is observed that the extent of correlation among the project parameters (gestation period and initial cost of projects) and cost overrun varies from one sector to other. The correlation figures do not bring out any indication of whether high initial cost or gestation period always leads to cost overrun. As for example, gestation period of power sector projects with largest capital outlay of

Table 3: Sectoral Distribution of Projects for which Data is Available

Sectors	No. of Projects	No. of projects for which data is available
Atomic Energy	6	6
Civil Aviation	11	11
Coal	66	66
Finance	1	1
Fertilizer	5	4
Info. & Broadcasting	7	7
Mines	2	2
Steel	11	11
Petrochemicals	3	3
Petroleum	51	51
Power	41	38
Heavy Industry	1	0
Railways	180	90
Surface Transport	41	40
Telecommunication	21	20
Others	7	6
Total	454	356

Rs. 43,759 crores is moderately correlated with cost overrun with R^2-value of 0.43, whereas for petroleum sector projects, also with high capital investment of Rs. 33,242 crores, gestation period apparently does not have any correlation with cost overrun with a low R^2-value of 0.06.

Table 4: Summary Results of the Statistical Analysis

	Sector	(GP*-CO+)		(IC#-CO)	
		R^2	p-value**	R*	p-value
1.	Civil Aviation	0.13907	0.2587	0.82381	0.0001
2.	Coal	0.31583	0.0000	0.03271	0.1461
3.	Petroleum	0.05759	0.0899	0.01524	0.3881
4.	Power	0.43050	0.0000	0.00616	0.6395
5.	Railways	0.09134	0.0038	0.38590	0.0000
6.	Steel	0.92078	0.0000	0.57613	0.0067
7.	Surface Transport	0.34139	0.0001	0.00887	0.5632
8.	Telecom-munication	0.01100	0.6600	0.70146	0.0000

* Gestation Period
\# Initial Cost
\+ Cost Overrun
** p-value represents observed significance level

It has been observed that for steel sector projects cost overrun is highly correlated with gestation period. It means that the cost overrun increases with increase in gestation period. For steel sector projects, cost overrun is also moderately correlated with initial cost of the projects. In case of infrastructure sector projects like railways and surface transport sector, the scenario is different. For railway projects, gestation period does not have much relevance with cost overrun, while for surface transport sector projects, gestation period has a moderate dependence on cost overrun. Railway sector projects consist of 40 per cent of the total 454 projects monitored by DPI. It has been observed from the correlation figures that for railway sector projects there is likelihood of more cost overrun when the initial cost of the projects is high. In fact, most of the railway sector projects are of smaller size with less capital investment, and due to the low gestation period for a large number of small project the R^2-value between gestation period and cost overrun is only 0.09 with high statistical significance.

It is evident from the results of the statistical analysis that the gestation period and initial cost do affect cost overruns, though the magnitudes may vary. The results of such analysis can be used by concerned project authorities in a very significant way to minimise the time and cost overruns. As for example:

- Project managers responsible for the projects of steel, power, surface transport and coal sectors should be very cautious to keep the projects within approved gestation period. It can be observed from the R^2-value and corresponding p-value of these sectors that the correlation values are highly statistically significant. On the other hand, project managers handling the projects of telecommunications, petroleum and railway sectors can somewhat tolerate some increase in gestation period up to a certain extent as these may not lead to much cost overrun.
- Project managers monitoring the projects of civil aviation, telecommunication, steel and railways sector projects should put more emphasis on initial cost aspect of the project to arrest possible cost overruns. Initial cost and cost overrun move in tandem for these sectors.

Project managers monitoring the projects of civil aviation, telecommunication, steel and railways sector projects should put more emphasis on initial cost aspect of the project to arrest possible cost overruns.

- It can be observed that the projects of certain sectors like steel sector are very sensitive to both the gestation period and initial cost angles in incurring cost overruns. Project managers must be very vigilant in assessing and controlling costs as well as gestation period for the projects of these sectors. In contrast to this, projects of some sectors, like petroleum, are less sensitive to both gestation period and the initial cost as regards cost overrun is concerned.

Project managers should take adequate measures including the use of appropriate project management techniques to minimise time and cost overruns. They should be aware of the factors that lead to an increase in the gestation period as well as initial cost of the projects.

Project Time and Cost Overruns

Massive cost overruns and high gestation period of projects are matters of great concern in implementing central sector projects. Based on the information given in the 1997-98 Annual Report of Department of Programme Implementation, the percentage occur-

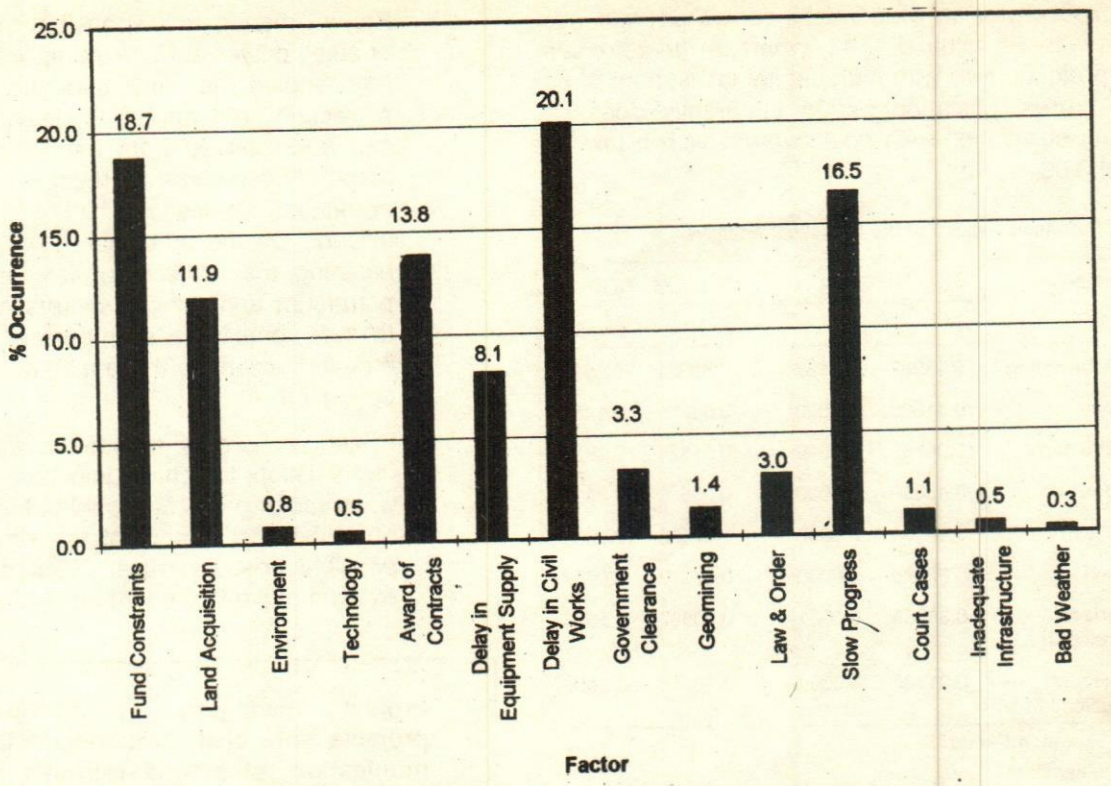


Fig. 10. Percentage Occurrence of Major Factors of Delay

rence of major factors of delay of central sector projects has been calculated and shown in Fig. 10. Some of the important reasons for time and cost overruns identified are delay in civil work (20.1per cent), fund constraints (18.7 per cent), slow progress of work (16.5 per cent), delay in awarding contracts (13.8 per cent), delay in land acquisition (11.9 per cent) and delay in supply of indigenous and imported equipment (8.1 per cent). The percentage occurrence of different factors may vary from year to year. As for example, according to 1995-96 Annual Report of DPI (Government of India, 1996) the most important reason for the delay in implementing central sector projects was slow progress of work (26.4 per cent) followed by delay in civil work (14.5 per cent), fund constraints (12.6 per cent) and delay in land acquisition (12.4 per cent).

The project management scenario of central sector projects reflects the inadequacy in handling the projects. It has been mentioned in the 1995-96 Annual Report of DPI that "It has been observed that project management as a discipline has not yet received the requisite recognition in the country. The major and mega projects are often being taken up for implementation without adequate preparation and without adopting modern management tools and equipments such as PERT/CPM" (Government of India, 1996, p. 4). One important factor contributing to the slow progress of many projects is the approval of projects without adequate studies, investigations and resource planning. Weak project management practices are also reflected from the fact that a large number of projects get dropped during implementation, while several projects do not have their target date of commissioning.

Measures for Better Project Management

It is noticed that since decades the project management practices in handling central sector projects in India is not working efficiently. It is strongly recommended to adopt better project management techniques with required rigour to minimize the large time overruns and heavy cost overruns. This would provide a good infrastructure support to the emerging Indian economy. Following suggestions are made for better project management:

- Strengths and weaknesses of the total project management system must be analysed and identified. Detailed case studies of some important projects can be made and lessons from these projects are to be utilized in subsequent projects. Selected projects for the study can include a few most successful and some least successful projects.

- Procedures of project management require thorough revamping. Basic procedures and subsequent remedial measures need to be implemented with strict compliance and accountability at different levels of hierarchy.
- Detailed analysis is to be done before the approval of each project.
- Strong emphasis is to be given on contract management.
- The right type of project organisation is to be selected, as all projects do not require similar type of project organisation.
- Care is to be taken to select component project leaders for different projects. The project leader should be capable of motivating and directing the human resource properly to integrate the various project resources optimally. Much-overlooked human aspects in project management, like team team-building, motivation, project communication, project leadership, and conflict resolution, need to be stressed upon and built in into the system.
- Existing practices of highly elaborate monitoring procedure with various review meetings and a large number of reports need substantial simplification. Effective use of advanced information technology should be used in a major way for fast information collection, processing and dissemination. A single data base is to be developed for the use of all concerned.
- Instead of the gestation period concept, each project must have a definite starting time and an expected date of completion. It can be enforced for all new projects.
- In view of perennial fund constraints, efforts should be put to complete most of the existing projects instead of approving a large number of new projects.
- Suitable project management softwares should be used. Proper and continuous training on latest computer-aided project management techniques should be a pre-requisite for any project improvement programme. Training programmes should be designed for people at all levels covering technical and non-technical persons, preferably starting from the higher hierarchy.
- Resource allocation should be made realistic with proper priority of projects.
- Project audit, in a standard format, can be made compulsory for all completed as well as "dropped-out" projects. Feedback should be utilized for future projects.

Acknowledgement

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Feature

State Financial Corporations: Challenges & Constraints of Liberalization

K.K. Subramanian

India being a vast country with resource diversity and federal setup, there are many problems for establishing a viable state level financial corporations. However, the present paper stresses the vital role of State Financing Corporation (SFCs) by virtue of ongoing economic liberalizations in the country. Structural constraints to support industrial development by SFCs are identified under present global competitive environment. However, the performance of SFCs in terms of realization of the developmental loans to states has been poor. The author has indicated policy measures to strengthen SFCs and to ensure their optimal performance.

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Introduction

In a vast country with resource diversity and a federal setup, development financial institutions (DFIs) at the state level are necessary to strengthen the process of financial intermediation, which supports industrialization in the states and thereby helps reducing regional disparities an idea that was well recognized in India decades ago and translated into action enacting State Financial Corporations (SFC) Act of 1951. Since then, these SFCs, numbering 18 in total, have been providing financial assistance on fairly liberal terms and stable rate of interest to the small and medium industrial enterprises for meeting the basic objective of industrializing the states. In the recent years, however, the policy-making process reflects some reservations on the significance of SFCs and their continuing relevance in the present context of economic liberalization. Thus, many segments of the financial sector have come under policy scrutiny and restructuring, but SFCs stand in isolation in the sea of economic reforms. This has led the SFCs suffer from a crisis of identity.

In the present paper, a proposition that the ongoing liberalization in the country enjoins a SFC to play a role more challenging than before Structural constraints to support industrial development under competitive environment have also been exposed. We then make a preliminary exploration into the contours of these constraints with a view to indicate directions for restructuring of SFCs and to transform them as a powerful catalyst in regional development.

Liberalization and Economic Reforms

The sweeping economic reforms underway in a wide range of sectors starting with industry and trade since 1991 have been producing mixed-impacts on the Indian economy. One area, where a distorted impact is seen, is the regional development. In the pre-reform

period, there were planned efforts on directing industrial investments into particular regions with a view to ensure a balanced regional development. With the onset of economic reforms based on market forces, the trend is towards new industrial investments to concentrate in the developed-states and the existing industries in the less-industrialized states to struggle for survival. To illustrate, the data on the investment proposals under Industrial Enterprise Memorandum (IEM) between August 1991 to December 1994 show that four states {viz. Maharashtra (19.7 per cent), Gujarat (17.3 per cent), UP (11.5 per cent) and Tamil Nadu (5.2 per cent)} shared more than one half of the total proposed investment leaving the remaining 21 states and 6 union territories to share the other less than one half. A large number of states are stagnating in growth and a few states are witnessing concentrated growth with the result that a significant regional differentiation continues to persist after the liberalization.

The sweeping economic reforms underway in a wide range of sectors starting with industry and trade since 1991 have been producing mixed-impacts on the Indian economy. One area, where a distorted impact is seen, is the regional development.

It follows that the logic of market, on which the ongoing liberalization is based, has failed to serve one of the development objectives and that institutional intervention is desirable to correct the market distortion. It also follows that, as the financial sector is more vulnerable to market-failures than other sectors, there is greater relevance of public sector financial institutions like state financial corporations (SFCs) for strengthening incentives to attract industrial investments into particular regions. Here, it must be noted that the gains to the real sector of the economy will depend on how efficiently SFCs perform the function of financial inter-mediation. Therefore, the challenge of the ongoing economic liberalization to SFCs is to improve upon their functional efficiency in mobilizing savings at a minimum transaction cost (higher operational efficiency) and channeling them optimally among competing demands (higher allocation efficiency) for accelerated industrial development of the states.

Working Scenario

Here, a relevant question comes up. Do the SFCs face some major constraints in meeting the challenges of the ongoing liberalization? if so, what are these? Perhaps, a comparative review of the working of SFCs during any period before and after 1991, the year of starting the ongoing process of liberalization, will throw some light.

Table 1: Trends in Sanctions and Disbursement of Financial assistance by SFCs

Year	Sanction (Rs Crores)	Growth rate (%)	Disbursement (Rs Crores)	Growth rate (%)
1970-71	49.6		33.5	
1971-72	64.1	29.2	39.6	18.2
1972-73	78.7	22.8	44.7	12.9
1973-74	103.1	31.0	54.6	22.1
1974-75	141.8	37.5	79.6	45.8
1975-76	155.5	9.7	98.8	24.1
1976-77	163.3	5.0	105.2	6.5
1977-78	166.1	1.7	107.4	2.1
1978-79	200.7	20.8	135.0	25.7
1979-80	263.8	31.4	184.8	36.9
1980-81	370.5	40.4	248.0	34.2
1981-82	509.6	37.5	317.7	28.1
1982-83	611.6	20.0	404.0	27.2
1983-84	644.9	5.4	435.5	7.8
1984-85	743.1	15.2	497.7	14.3
1985-86	1009.1	35.8	608.5	22.3
1986-87	1210.8	20.0	791.9	30.1
1987-88	1305.0	7.8	942.5	19.0
1988-89	1391.1	6.6	1055.2	12.0
1989-90	1514.2	8.8	1190.2	9.6
1990-91	1863.9	23.1	1270.8	9.9
1991-92	2190.3	17.5	1536.8	20.0
1992-93	2015.3	–8.0	1557.4	1.3
1993-94	1908.8	–5.3	1563.4	0.4
1994-95	2702.4	41.6	1880.9	20.3
1995-96	4188.5	59.0	2961.1	57.4
1996-97	3304.6	–21.1	2678.4	–9.5
1997-98P	2911.4	–11.9	2227.1	–16.8
cumulative upto March 98	29217.1		23123.1	
growth-period 1970-71 to 1979-80		21.0		21.5
1980-81 to 1989-90		19.7		20.5
1990-91 to 1997-98		11.9		10.4
1970-71 to 1997-98		17.8		17.8

Source: IDBI Report on Development Banking in India (various issues)

P = provisional

Before attempting such an exercise, the large size of SFCs' operation in the economy may be noted. The

Table 3: Share of SSIs in Total Disbursement by SFCs

Year	SSI	SRTO	Sub-total	Total Disbursal	SSI's share in total (col.2 % col.5)	Share of SSI + SRT In total (Col.4%5)
1985-86	452.8	52.9	505.8	608.5	74.4	83.1
1986-87	587.2	55.7	643.0	791.8	74.2	81.2
1987-88	697.6	74.7	772.3	942.3	74.0	81.9
1988-89	774.7	96.7	871.4	1055.0	73.4	82.6
1989-90	857.0	125.1	982.1	1190.2	72.0	82.5
Avg.5 yrs.	673.8	81.0	755.0	917.5	73.4	82.3
1992-93	1163.9	167.3	1331.2	1557.4	74.7	85.5
1993-94	1175.2	129.2	1304.4	1563.4	75.2	83.4
1994-95	1314.5	122.5	1431.9	1880.0	69.9	76.2
1995-96	1675.4	212.1	1887.5	2961.1	56.6	63.7
1996-97	1529.5	221.1	1750.6	2678.4	57.1	65.4
Avg.5 yrs.	1371.3	170.4	1543.1	2128.0	66.4	72.5

Source: IDBI Report on Development Banking in India

Table 4: SFC Loan Disbursement to Backward Areas

Year	Amount Rs. crores	% to total disbursement
1985-86	326.7	53.7
1986-87	437.2	53.2
1987-88	503.0	55.4
1988-89	584.4	53.5
1989-90	636.9	53.5
Avg.5 yrs.	496.8	54.1
1992-93	685.5	44.4
1993-94	628.4	40.2
1994-95	787.2	41.8
1995-96	1062.5	35.9
1996-97	1201.3	44.8
Avg.5 yrs.	872.9	41.0

Source: IDBI Report on Development Banking in India

Thus, a quick review of the working of SFCs in terms of their lending operation after 1991, as compared to the earlier period points out a relatively poor performance in meeting the basic objectives after the introduction of ongoing liberalization in the country. It may be that the environment and SFCs, which continue to organize and operate in the old style (protection environment), are faced with some structural constraints.

Scope for diversification

At present, SFCs lending activity is restricted to finance block-capital requirements of industrial enterprises. This means that the latter are left to the mercy of commercial banks for meeting their working capital requirements. Therefore, there is case for SFCs' diversification for extending working capital credit to industrial units. The significance of SFCs' diversifying into working capital financing arises from the dismal fact that the credit-deposit ratio of commercial banks in industrially weak states has been poor both in absolute and relative terms. The commercial banks have all-India base for financial operations and they tend to favor the relatively developed states, probably on grounds of operational flexibility and convenience, and to give inadequate attention to financing enterprises control over the commercial banks' lending operation. It is, therefore, logical that a state-level institution like SFC comes forward to help the assisted industries in the state by financing the working capital requirement, which is vital for SSIs' successful operation in the present context.

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At present, with the difficulty in getting working capital finance from the commercial banks in time, and in the absence of SFCs providing working capital loans, many industrial units, which have received SFC's block-capital assistance, are born sick leading to defaults in the repayment of SFC-loan with interest. This situation raises the SFCs' non-performing asset (NPA) and worsens their financial health. Besides, it has an impact on stagnating industrial growth and employment in the states.

Structural Constraints

In this context the capital inadequacy may be dealt with at first. Needless to say, the paid-up share capital is one of the least-cost sources of funds for SFCs' operations.

Inadequate Share-capital Base

Generally speaking, inadequacy of share capital is a major structural constraint of SFCs for increasing their operation. This constraint becomes a crisis in those cases, where the SFC is in upward trend to make good finances and requires more funds to finance and promote industries in the industrially weak states. At present, a good number of SFCs are weak and need restructuring of their capital base. It is a sad commentary of the present system that neither the state government nor the IDBI is willing to take policy decisions on raising the capital base of weaker SFCs. The concerned state governments defend their reluctance in terms of the general lack of budgetary resources. The stand of IDBI reflects nothing but its indifference to SFCs. Clearly, there is the need for raising the capital base of a number of SFCs. If necessary, the authorized capital base should be enlarged and private participation in the ownership increased without impairing the effective control of the state government.

Lack of Concessional Line of Credit

Needless to say, borrowing constitutes the most important source of funds for SFCs. As the privileged (low interest rate) sources of secure finance are drying up with the liberalization, SFCs are forced to limit their role of financial inter-mediation. It seems, therefore, necessary to open a special line of credit at concessional rate by IDBI/SIDBI for some more years to enable SFCs to meet the challenges of post-reform era.

Restrictive Terms of Refinance

The current pattern of financing the SFCs' operations implies relatively higher interest-cost payments to mobilize funds. The refinance from IDBI/SIDBI is a vital source but the terms are restrictive. The IDBI/SIDBI takes away the refinance amount along with interest in time from SFCs whereas, the latter do not generally get repayment of principal and interest in time from their clients. The result is low rate of recovery and accumulation of large arrears, of which a good part becomes NPA. In other words, the all-India level primary lending public-sector DFI avoids sharing, and makes the state level SFCs to bear fully, the risk of financing the SSI units for the industrialization of the states. This leads to a situation in which SFCs take loans from IDBI/SIDBI for increasing their lending operations to promote industries by refinance and repay them by borrowing from other sources even at a higher cost! This funny situation forces the SFCs to line-up in the debt-trap and to survive in poor financial-health.

Inadequate provisioning for NPAs

In this context, it is seen that there is no fund for revival of non-performing assets (NPA) of SFCs. In striking contrast, when the provisioning against NPA accumulates in a bank or IDBI or other all-India financial institution, the Reserve Bank of India or the Government of India comes to rescue. In the case of SFCs, there is no one to give a helping hand to revive their NPAs. Thus, the non-existence of funds for revival of NPAs is another major constraint faced by the SFCs. This needs to be rectified with financial assistance from the government.

Again the level of arrears from the client industries is at present quite high; this, is not so much because of the acceptance of social obligation of lending to some sectors at concessional rates of interest but because of the deteriorating asset-quality. A situation of increasing arrears indicates *inter-alia,* inadequate project appraisal, unwise decisions on lending operation without prudential norms, indifference to follow-up the progress of assisted units, and ineffective monitoring of the recovery, by the SFCs. Indeed, all these are the symptoms reflecting badly upon the SFCs' functional-efficiency, portfolio-quality, and financial-health.

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It is relevant to recognize that the poor portfolio-quality that adversely affects the financial health of financial institutions, has mainly been brought about by the political and administrative interference. It is not uncommon to hear stories of how the pressure from some influential politicians and other vested interests has forced the management of SFCs in some states to sanction loans to entrepreneurs, whose integrity is questionable and project proposals are non-viable. Such SFC-assisted industries become sick at the very birth and a drag on the growth of industrial income and

employment in the concerned states. They also contribute to the financial ill health of SFCs which in turn restricts the latter's business operations and thereby, their role in supporting accelerated industrial growth in the states.

Indeed, the situation arising from the fast accumulating arrears and NPAs of the SFCs is explosive and needs to be changed. Here, an institutional framework for revival of potentially viable sick units deserves consideration. For example, an ad-hoc special fund could be created with grants and other financial assistance from the central government, state governments, IDBI/SIDBI and other concerned bodies for financing the revival of viable sick-units, which would then be in a position to settle the arrears due to the SFCs. The aim is to clean up the present messy-conditions and provide for a congenial environment for the potentially efficient industries to prosper under the conditions of competition. Here, a matter that may also receive the government's attention is setting up a legal forum like Loan Recovery Tribunal.

Nexus with the government

Another line of corrective step lies in restructuring the managerial tasks relating to project appraisal, follow-up of assisted units, monitoring of recovery etc. so that the risk of defaults by the clients can be minimized in future.

How the managerial tasks are organized and implemented in a SFC is related to the professionalism and autonomy of its top-level management, which in turn is influenced on, who controls the SFC. This takes us to consider the pattern of control over SFCs. Generally, SFCs are under the administrative control of the concerned state governments and operational control of IDBI. In practice, however, a SFC is under the full control of the state government. The state government's control is clearly manifested in the general tendency of appointing officers from the Civil Services as the chief executive officer (CEO) of a SFC. In fact, a major constraint of SFCs, as the Narasimhan Committee has underscored, is the nexus with the government and the consequent political and bureaucratic interference in the day to day operations. It also needs no emphasize that efficient functioning in a competitive environment needs at the head of a SFC a person with business vision, professional expertise and leadership qualities. His presence at the helm for a continuous period (say, five years) is also needed for pursuing stable policies and sustained growth. The present practice of posting a bureaucrat, however meritorious the particular individual may be in Civil Service, to head a SFC, quite often for a short duration, should be scraped. The government may retain the privilege of exercising say in the appointment of the CEO, but the choice should be made from a panel of experienced professionals with proven business capability and social commitment suggested by a search committee appointed by the board of directors for this purpose. Also, the composition of the board of directors should reflect the same spirit.

The foregoing discussion has identified some major constraints that SFCs face in operating in a competitive environment of the ongoing liberalization. Among these, the critical constraint appears to be the nexus with the government and the loss of managerial autonomy to operate in a competitive environment. And it is, therefore, necessary to work out a scheme for autonomy of the financial institutions enabling them in the process to distance themselves from the government in matters of internal administration. Indeed, financial inter-mediation by public-sector financial institutions with liberal loans to industries has a supporting role to foster industrialization but these financial institutions must proceed with care, as otherwise, there is a danger of a lot of money being locked up in ventures, which do not prove fruitful. As emphasized by the Narasimhan Committee, "it is necessary for state level institutions to function on business principles based on prudential norms and have a management set-up appropriate to this objective". Here, the call is for full managerial autonomy.

Among these, the critical constraint appears to be the nexus with the government and the loss of managerial autonomy to operate in a competitive environment.

The point for emphasis is this. The basic objective of a SFC has a societal content and therefore, the state government should have say in shaping its broad policies. But the management has to be given enough autonomy to detail out the policies, translate them into sound business-plans, and to put them into effective and profitable operations by shaping the functional efficiency of financial inter-mediation in order to foster economic development of the concerned state.

Kerala SFC: Case Study

The aggregated picture of all the 18 SFCs taken together has helped us drawing the contours of some general problems, rather constraints, in the present structure and working of SFCs in the present context. Admittedly, there are differences in the nature and specificity

of the problems in individual SFCs. Yet, a case study of an individual SFC may be useful to illustrate the complexity of the nature and impact of the critical constraints that are common to all. We have selected Kerala Financial Corporation (KFC) for such a case study. The choice of KFC is guided by the consideration that it is listed in category "A" of IDBI's classification of SFCs based on the financial health. It is also one of the few profit-making state public-sector enterprises in Kerala. However, it must be kept in mind that the financial inter-mediation by KFC and other DFIs for more than four decades did not make much changes to Kerala's industrial scene! Even today, Kerala continues to remain industrially backward.

At present, paid-up share capital of KFC amounts to Rs. 92 crores, which is largely contributed by the state government (83.62 per cent) and the IDBI (18.12 per cent). The state government controls it. During the functioning for more than 45 years since its inception up to March-end 1998. it has considered financial assistance of 37794 cases and sanctioned 27924 cases (74 per cent) involving a net sanctioned amount of Rs. 1387.87 crores. The net disbursement has amounted to Rs. 1125.50 crores. This presents an impressive record of financial inter-mediation.

However, the evaluation of KFC's performance in a wider perspective of its main objectives would call for answers to a number of larger questions. What has been KFC's role in helping the assisted-units to raise their productivity, profitability, and growth? How many of the KFC-assisted units are making profits? What has been their contribution to the growth in industrial income and employment in the state? How many have turned "sick"? How many are close down? Studies are not there to help answering these questions. And if there were, the answers perhaps could be embarrassing to KFC! For, general studies on industrialization in Kerala have shown that the rate of growth of small-scale sector has been relatively fast in the state, but the incidence of sickness and mortality of small-scale sector has been relatively fast in the state, but the incidence of sickness and mortality of small-scale units was also high. Among the various factors contributing to the sickness and mortality, the lack of finance, especially the working capital, is reported to be an important one. Indeed, this badly comments upon the performance of financial institutions including KFC in the state. Still it must be said to the credit of KFC that its performance in terms of profitability is better relative to the ones in other industrially backward states (see Table 2).

There are, however, some smudged shades to the picture. The share of SSI in the total assistance disbursed during the period from inception up to March end 1998, is 56 per cent only. The more distressing trend is that its share has declined in the recent years. To illustrate, SSIs' share in total disbursed assistance was 48 in 1996-97 and it further declined to as low as 37 per cent in 1997-98. Similarly, the backward districts have received a relatively small share of the total financial assistance disbursed by KFC.

It is not clear whether it is a deliberate policy of the management to sideline the small borrowers and prefer the increase in business based on the credit demand of the bigger units with a view to post the balance sheet with more profits? Or could it be that the bigger units are able to influence the sanction and disbursement of assistance from KFC? In any case, it is a sad commentary on the working of KFC, which is established mainly to finance and promote small enterprises, that a substantial part of its funds is being "hijacked" by the relatively bigger units in the more developed districts in the state. These are not good portents.

Poor Loan Recovery

The more serious problem in the operation of KFC is the increasingly large outstanding loans from its clients with a high incidence of arrears of sub-standard variety. The recovery rate has been poor in the past, though there has been some improvement in the recent years (see Table 5). The result has been the increasing size of accumulated arrears. The share of arrears in the total demand (arrears + current demand) averaged more than 50 per cent per year throughout since the mid-eighties and in fact, it has been marginally higher during post-reform.

Table 5: Kerala Finance Corporation Recovery Ratio of Demands (arrears and current)

Year	Demand Arrears	Demand current	Demand total	%share of arrears in total demand	Total Recovery	Recovery Ratio (col. 6 As % col.4)
1985-86	3555	2450	6005	59.20	1760	29.30
1986-87	4245	4907	9152	46.36	2501	27.32
1987-88	6477	4717	11194	57.86	3725	33.27
1988-89	7469	5664	13133	56.87	4283	32.61
1989-90	8850	7832	16682	53.05	5502	32.89
1992-93	11180	9957	21138	52.89	7437	35.15
1993-94	13704	10239	23943	57.23	8362	34.92
1994-95	15581	12814	28395	54.87	9704	34.17
1995-96	1869	14901	33597	55.65	14094	41.95
1996-97	19503	17209	36712	53.12	15735	42.86
1997-98	20977	18462	39439	55.18	16556	41.97

Source: KFC Annual Report 1998.

Thus, the poor recovery performance has raised the accumulated arrears and also affected the asset-quality profile. The distribution of arrears as on November 30, 1998 by the age-profile (see Table 6) shows that the proportion of arrears less than 6 months (standard type) is the lowest whereas, that of more than 5 years (doubtful II type) is the highest.

Table 6: Age-profile of Arrears due to KFC as on 30-11-1998

Type of arrear by age	Amount (Rs. Crores)	Percentage
Standard (up to 6 months)	45.48	10.67
Sub-standard (6 months to 2-1/2 years)		
Doubtful I (2-1/2 years to 5 years)	98.13	23.02
Doubtful II (5 years and Above)	205.74	48.26
Total	426.28	100.00

Source: Collected from KFC.

Needless to say, the large size of accumulated arrears and its skewed age-structure reflect the lack of professionalism in the management tasks related to project evaluation follow-up of the business performance of client-industries, monitoring of repayments and recovery, and prudential norms of financial inter-mediation. It also indicates the lack of professionalism and long-term business vision at the top-level management.

The management of KFC is vested with the board of directors with 12 members, of whom 5 are nominated/ appointed, by the state government and 2 by IDBI. The Chairman and Managing Director are appointed by the state government and have been bureaucrats from the Civil Service. All these may be consistent with KFC's ownership-structure; but these also may imply the state government's absolute control and KFC's loss of full autonomy in the operation. Indeed, it is legitimate that the state government has the right to guide KFC on industrializing the state. Here, it is rather strange to note that the government's industry department, which is the focal point for giving the thrust to industrial development of the state, is not represented on the board of directors. It looks that it is the finance department hat cares and controls KFC, which is established to support the accelerated industrialization in the state!

These and other bad portents in the management of KFC, to some extent, can be attributed to its nexus with the state government. Some distancing from the government may be, therefore, desirable to improve the autonomy and the working of KFC. And there are also other factors contributing to the structural constraints of KFC in operating under the present context of competitive environment. Clearly, there is a need for restructuring of KFC to improve its functional efficiency for meeting the objectives for which it is established namely, to finance and promote small and medium industries for accelerated growth of income and employment in Kerala.

Conclusions

Reverting to the main theme of the paper, namely the challenge and constraints of the liberalization to SFCs in general, we emphasize the relevance of SFCs in the context of the ongoing liberalization in the country. In fact, SFCs have more challenging roles than before. The strategic role of SFCs is to be explicitly recognized. We also assert that SFCs are equally important as all-India DFIs and commercial banks for national development and, therefore, should be treated on par with them. At the same time, there are several problems, rather constraints of structural nature, which SFCs face when operating in the market-economy environment of the ongoing liberalization. The preliminary exploration has revealed the broad contours of these constraints as well as the lines of restructuring of SFCs. The case study of KFC has shown that the urgency as well as the specificity of restructuring may differ with individual SFCs, as there are variations in the incidence of the constraints across the individual SFCs and the states. However, the complexity of the nature and impact of some common constraints, as revealed by our study, makes out a strong case for a comprehensive inquiry into the working of SFCs. The objective is to identify detailed lines of restructuring and improving functional efficiency and financial profitability of SFCs' financial intermediation, which supports a pattern of industrialization in the states leading to a more balanced regional development, under the ongoing process of economic reforms, in the country. □

Feature

Changing Scenario of Electricity Consumption in Indian Agriculture

A. Narayanamoorthy

The study notes that growth rate of electricity consumption in agriculture is higher than the growth rate of the same in other major sectors namely industry and domestic sectors. The rate of increase in electricity consumption is much higher than the rate of increase in area under groundwater and electric pump-sets. The analysis of correlation and regression shows that area under groundwater and number of electric pump-sets are the important factors responsible for the significant increase in the consumption of electricity. The state which has higher ratio of area under groundwater to the net irrigated area consumes higher amount of electricity per pump-set.

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Introduction

Electricity is not only important input for industrial development but also a necessary input for the development of agriculture especially in post-green revolution era. In the recent period, electricity use in agriculture has been increasing at a fast rate compared to other sectors of the economy namely industry and domestic. While the consumption of electricity in industrial sector in the total use declined from 70 per cent in 1960-61 to 41 percent in 1992-93, the same in the agricultural sector has increased significantly from a mere six percent to about 30 per cent during the same period. Though the consumption of electricity in absolute term has increased impressively in all the important sectors, its growth rate pertaining to agricultural sector is substantially higher.

Though there are many reasons for the rapid increase use in agriculture, the introduction of Rural Electrification Programme (REP) is considered to be the most important reason. In fact, Government has been giving due importance for the development of rural electrification network[1] specially to develop groundwater irrigation through energisation of pump-sets since the inception of five year plans. It is well known fact that because of the electrification programme, the number of electric pump-sets have increased from 1.60 lakhs in 1960-61 to 102.76 lakhs in

1. Rural Electrification Programme (REP) was introduced as a plan programme in the First Plan. The importance of this programme was recognised during the drought in the mid-sixties, when lift irrigation had to be resorted to on a large scale to save subsistence crops. The REP gained special importance for providing electricity for operating agricultural pump-sets to utilise available groundwater potential. In 1969, Government formed Rural Electrification Corporation (REC) to strengthen it and provides over 90 per cent of funds for rural electrification as concessional loans to the State Electricity Boards (Govt. of India, 1992).

1993-94, an increase of about 64 times[2]. As a result of this, the percentage of groundwater area to the Net Irrigated Area (NIA) has increased significantly from 29 per cent in 1960-61 to over 53 per cent in 1992-93[3]. It is needless to mention that when area under groundwater increases, electricity use in the agricultural sector also increases, as the major portion of electricity is consumed by pump-sets which are being used for lifting water from wells (Sharma, 1994; GoI, 1992).

There will not be any problem as long as the increasing rate of groundwater area irrigated by electric pump-sets is more than the rate of increase of electricity use. But, recently many researchers have argued that the introduction of Flat-Rate (FR) electricity pricing policy in agriculture has significantly increased the per pump-set consumption of electricity when compared to the area under groundwater irrigation. This means that farmers use electricity inefficiently under the FR system as the marginal cost (MC) of electricity under FR pricing system is almost near zero (Abbie et al., 1982; GoI, 1989 & 1992; Vaidyanathan, 1994). However, as many factors determine the use of electricity besides tariff rate, it is difficult to say clearly whether cheaper electricity pricing policy alone is responsible factor for the rapid increase of electricity use in agriculture (Narayanamoorthy, 1997). Fast increase of electricity consumption could be because of the fast development of groundwater in many states in the recent years[4]. Moreover, besides tariff policies, factors like development of groundwater irrigation, level of exploitation of groundwater, cropping pattern of the groundwater irrigated area, area under water consuming crops, availability of groundwater and surface sources of irrigation, efficiency of the electric pump-set used for pumping water from wells etc. determine the electricity use in agriculture. Hence, one has to consider all these factors while studying consumption of electricity in agriculture.

Many studies have analysed the impact of electricity tariff policies on the consumption of electricity and management of groundwater (Copestake 1986; Shah 1993; Palmer Jones 1994; Narayanamoorthy 1996 and 1997), but the analysis of the recent trends and development of electricity consumption in Indian agriculture is meagre. Hence a modest attempt has been made in the present paper to understand the trends and determinants of electricity use in agriculture using macro-level data. The main objectives of this paper are; (1) to understand the growth of use of electricity in agricultural sector for different periods from 1960-61 to 1990-91 and compare with other important sectors, (2) to find out the relationship between consumption of electricity and the area under groundwater as well as number of electric pump-sets and (3) to analyse the factors which determine the electricity use in agriculture.

Flat-Rate (FR) electricity pricing policy in agriculture has significantly increased the per pump-set consumption of electricity when compared to the area under groundwater irrigation.

Data and Method

As the factors determining electricity consumption vary significantly across the states, the results relating to the national level may not be similar with different states. Therefore, the present study has separately analysed the national as well as the state level position of electricity consumption in agriculture. For this, data related to electricity use in agriculture, area under groundwater, total number of electric pump-sets, gross irrigated area (GIA), area under water consuming crops, proportion of groundwater area to gross irrigated area etc. have been compiled for the major states as well as for total India for the period 1960-61 to 1990-91 from different reports published by Central Water Commission (CWC), Ministry of Agriculture (MOA). Fertiliser Statistics of Fertiliser Association of India (FAI) and the publications of Centre for Monitoring Indian Economy (CMIE).

To understand the pace of growth of electricity consumption for different periods, growth rates have been computed using log-linear function ($\log Y = a + bt$) and linear function ($Y = a + bt$) has been employed to study the absolute change. To understand as well as to capture the factors which influence the growth of electricity consumption in agriculture, correlation and multiple regression have been computed.

Trends in Electricity Use

Consumption of electricity has increased in all the

2. It has not only increased electric pump-sets but also changed proportion of electric pump-sets in the total pump-sets (electric plus oil pump-sets). Proportion of electric pump-sets in the total pumpsets has increased from 23.4 per cent in 1990-91.

3. In absolute terms, the area under groundwater has increased from 7.4 m.ha in 1960-61 to 26.50 m.ha. in 1992-93, an increase of over 3.58 times (CMIE, 1996).

4. For instance, states like Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Orissa and West Bengal altogether had only 11.50 lakh hectare of groundwater area (9.36 per cent of total groundwater area) during 1970-71, but these same states altogether accounted for 71.35 lakh hectares of groundwater area (29.53 per cent of total GWA) during 1990-91.

major sectors since independence in Indian agriculture. The proportion of different sectors in the total use has undergone substantial changes. The major changes have occurred in two sectors namely industry and agriculture. Industrial sector accounted for nearly 70 per cent of the total electricity consumption in 1960-61, but this share declined to about 40 per cent in 1992-93. On the other hand, consumption of electricity in agricultural sector has increased from a mere six per cent to about 30 per cent during the same period (Fig. 1). Though the consumption of electricity has increased consistently over the period, the growth may not be the same across different periods. Therefore, as mentioned earlier, to understand the trends in electricity consumption across major sectors, computed growth rates using log-linear function and linear function were computed. The former has been employed to show the growth rate in terms of per cent per annum and the latter has been used to understand the average increase of electricity consumption in absolute term. Growth rate computed for electricity consumption for different periods as well as for different sectors is given in Table 1. As expected, the rate of growth[5] of electricity during 1960-61 to 1992-93 is not the same across the major sectors of the economy. Growth rate of electricity consumption in the industrial sector was 11.66 per cent/annum during 1960-61 to 1970-71, whereas the same was only 5.4 per cent/annum during 1980-81 to 1992-93. At the same time, growth rate of electricity consumption in the agricultural sector was much higher than other sectors both in the seventies (1970-71 to 1980-81) as well as in the eighties (Table 2). Further more, the rate of growth of electricity consumption computed by taking the whole period (from 1960-61 to 1992-93) also shows a substantial difference between industrial (6.54 per cent) and agricultural (14.15 per cent) sectors. The results of trend exercise computed to understand the year-wise average use of electricity consumption (Table 3) also shows that electricity consumption in agricultural sector has been increasing at a very fast rate compared to industry. For instance, during the period 1960-61 to 1970-71, the average increase of electricity consumption in agricultural sector was only about 263 million Kwh per annum, while the same was about 2024 million Kwh per annum in industrial sector. But the position has entirely changed in the succeeding periods. During the eighties (1980-81 to 1990-91), the average consumption of electricity is almost the same in both the industrial and the agricultural sectors. All these clearly show that the consumption of electricity in agriculture sector has been increasing at a faster rate at the national level.

5. Growth rate of electricity consumption for different sectors has been computed using absolute figures (Kwh) and not by using proportion of each sector.

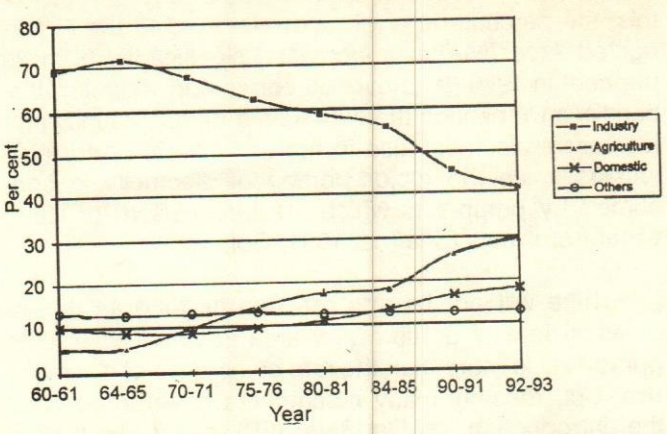

Fig. 1. Consumption of Electricity by Sectors: India

Table 1: Growth Rates of Electricity Use by Sectors: All India

Sector	1960-61 to 1970-71	1970-71 to 1980-81	1980-81 to 1992- 93	1960-61 to 1992-93
Industry	11.66*	5.77*	5.39*	6.54*
Agriculture	19.04*	12.98*	14.10*	14.15*
Domestic	9.52*	9.72*	13.06*	10.56*
Others	11.74*	6.81*	8.34*	8.09*

Source: Computed from CMIE (1994).

Notes: Values are significant at one per cent level.
Growth rates are computed using log-linear function.

Though use of electricity in agricultural sector has increased substantially at the national level, it may not be the same across different states as the factors which influence the use of electricity widely very across the states in India. Therefore, one resorts to a comparison between percentage change for different states to understand the state-wise growth of electricity. Table 4 includes the information relating to growth of electricity use in agriculture for all the major states for the period 1965-66 to 1992-93. It is evident from the table that consumption of electricity in the agricultural sector has increased substantially in absolute term in all the major states of India. Again, the rate of increase of electricity use in the agricultural sector is much higher than the rate of increase in total consumption of electricity (combined use of all sectors) in all the states. Another important point is that the proportion of electricity consumed by the agricultural sector in the total use of each state has also increased in almost all the states. Although electricity use has increased in almost all the major states, the increasing rate is not the same across different states. In states like Andhra Pradesh, Bihar, Gujarat, Karnataka and Maharashtra, the increasing rate of electricity consumption is also much higher than the average arrived at the national level. Surprisingly, the increasing rate is below the national level in states like Uttar Pradesh, Tamil Nadu,

Table 2: Average Value of the Study Related Variables: All India

Variable Name	1970-1 to 1990-1	1970-1 to 1980-1	1980-1 to 1990-1
Electricity use by Industry	52162.18 (17477.71)	38366.13 (7268.79)	65689.14 (12085.86)
Electricity use by Agriculture	18601.49 (13443.93)	8878.02 (3436.15)	27951.79 (12295.74)
Electricity use by Domestic	12480.78 (8595.89)	6012 (1852.86)	18652.93 (7581.57)
Electricity use by Others	12373.65 (5441.32)	8171.01 (1772.50)	16409.87 (4365.87)
Tube Well Area (m.ha)	9.44 (3.20)	6.88 (1.73)	12.00 (1.76)
Other Well Area (m.ha)	8.22 (0.52)	7.82 (0.36)	8.61 (0.26)
Total Groundwater Area (m.ha)	17.66 (3.70)	14.70 (2.05)	20.62 (2.00)
Number of Pumpsets (lakhs)	42.69 (21.11)	26.04 (8.27)	59.06 (14.99)
ETY Per pumpset (kwh)	3953.94 (898.81)	3341.93 (279.17)	4538.79 (870.87)
IWCC (m.ha)	34.15 (5.08)	30.22 (3.38)	38.21 (2.28)
GIA (m.ha)	49.42 (7.47)	43.48 (4.35)	55.39 (3.81)
Cropping Intensity	123.82 (3.83)	120.85 (2.09)	126.86 (2.28)
IWCC/GIA x 100	69.13 (1.27)	69.44 (1.27)	69.04 (1.43)
ETY Use/ha of GWA	957.05 (511.07)	584.99 (151.13)	1316.59 (454.94)
GWA/NIA x 100	45.12 (3.88)	42.14 (2.49)	48.15 (2.02)

Source: Computed from CMIE, (1994) and (1994a).

Notes: Figures in brackets are standard deviation; Electricity (in million Kwh);
IWCC – Irrigated Water Consuming Crops;
GIA – Gross Irrigated Area;
NIA – Net Irrigated Area;
GWA – Groundwater Area.

Punjab and Haryana. This is because of the reason that these states had consumed a considerable portion of electricity even in 1965-66 as they had higher proportion of electric pumpsets. In the case of other states, use of electricity increased only in the recent years due to the recent development of groundwater irrigation and significant development in the cultivation of water intensive crops.

The growth rate in electricity use for the major states were also computed for the period 1980-81 to 1992-93 separately for the agricultural sector and also for the total consumption (all sectors). This is done to understand the differences in the growth of electricity consumption

Table 3: Results of Linear Trend Exercise for Electricity Consumption by Sectors: All India

Sectors/Period	a	b	R^2	N
1960-61 to 1970-71				
Industry	7290.4	2024.7*	0.99	11
Agriculture	–15.2	362.9*	0.92	11
Domestic	1175.2	226.5*	0.98	11
Others	1305.1	391.1*	0.98	11
All Total	7756.2	3005.3*	0.99	11
1970-71 to 1980-81				
Industry	4193.4	2129.6*	0.94	11
Agriculture	–7566.9	1027.8*	0.98	11
Domestic	–2811.6	551.5*	0.98	11
Others	–255.1	526.6*	0.97	11
All Total	–6440.2	4235.5*	0.97	11
1980-81 to 1990-91				
Industry	–28110.1	3607.7*	0.98	11
Agriculture	–65823.9	6306.8*	0.94	11
Domestic	–39855.1	2250.3*	0.96	11
Others	–17379.0	1299.6*	0.97	11
All Total	–151168.0	10764.3*	0.98	11
1960-61 to 1990-91				
Industry	3564.7	2358.3*	0.97	11
Agriculture	–8300.2	1345.3*	0.82	11
Domestic	–4184.7	838.4*	0.80	11
Others	–987.1	654.8*	0.93	11
All Total	–9925.4	5196.8*	0.92	11

Source: Computed from CMIE, (1994).

Notes: Electricity consumption in million Kwh;
* – Significant at one per cent level.

across the states. As in the case of absolute consumption, growth rate of electricity use also varies significantly across the states (Table 5). Rate of growth in electricity use in the agricultural sector is significantly higher than the growth rate of total consumption of electricity in all the major states except Rajasthan and Tamil Nadu. It is also observed from the state-wise data that there is a positive relationship between growth of electric pumpsets and growth of electricity consumption. For instance, during 1980-81 to 1992-93, in states like Bihar, Haryana, Tamil Nadu and Uttar Pradesh, the growth rate of electric pump-sets ranges from 1.55 to 1.64 and the growth rate of the same states in electricity use ranges only from of 6.6 to 12.5 per cent per annum. At the same time, the state which achieved more than two times change in pump-set has a growth rate in the range of 9.98 to 28.53 per cent per annum in electricity consumption. Thus, it is seen that, although there are variations in electricity use across the states, electricity consumption of the agricultural sector has increased impressively in almost all the states.

Table 4: State-wise Electricity Consumption: Agriculture and Total

(in million Kwh)

States	1965-66 (1)		1970-71 (2)		1980-81 (3)		1992-93 (4)		Ratio (4/1)	
	Agri-culture	Total	Agri-culture	Total	Agri-culture	Total	Agri-culture	Total	Agri-culture	Total
Andhra Pradesh	173	1048	408	2193	977	5086	8095	19336	46.79	18.45
Bihar	29	1933	69	2585	435	3756	1549	7858	53.41	4.07
Gujarat	101	1796	405	3322	1334	7566	7804	20000	77.27	11.14
Haryana	–	–	299	891	954	2556	4063	8091	13.59	9.08
Karnataka	66	1382	180	2973	393	5164	5374	12948	81.42	9.37
Kerala	24	750	41	1525	80	2756	235	5698	9.79	7.60
Madhya Pradesh	12	1028	65	1883	345	4567	3750	16065	312.50	15.63
Maharashtra	90	4717	357	7650	1724	14037	8068	34428	89.64	7.30
Orissa	2	977	11	1599	59	2480	280	5320	140.00	5.45
Punjab	211	2350	464	2116	1850	4997	6144	13937	29.12	5.93
Rajasthan	20	326	113	499	1009	2935	3097	10635	154.85	32.62
Tamil Nadu	820	3222	1275	5146	2367	8595	5226	19645	6.37	6.10
Uttar Pradesh	316	2372	721	4285	2792	7846	8536	21890	27.01	9.23
West Bengal	4	4065	21	4754	72	5678	738	10030	184.50	2.47
All India	1892	26735	4470	43724	14489	82367	63328	220674	33.47	8.25

Source: CWC (1996).

Table 5: State-wise Growth Rates of Electricity Consumption: 1980-81 to 1992-93

States	Growth Rate*		Change in Pumpsets ('000)		
	Agri-culture	Total	1980-81	1992-93	Ratio (4/3)
Andhra Pradesh	2042	11.15	472	1409	2.98
Bihar	12.56	5.99	160	262	1.64
Gujarat	18.71	8.97	231	520	2.25
Haryana	11.92	9.37	218	399	1.83
Karnataka	28.53	8.07	311	886	2.84
Kerala	9.79	6.73	90	271	3.01
Madhya Pradesh	20.84	10.74	315	1008	3.19
Maharashtra	14.49	8.34	658	1777	2.70
Orissa	14.39	6.68	17	62	3.63
Punjab	11.84	9.65	291	649	2.23
Rajasthan	9.98	11.53	205	445	2.17
Tamil Nadu	6.64	7.69	912	1412	1.55
Uttar Pradesh	10.99	9.22	399	704	1.77
West Bengal	21.73	4.49	29	96	3.31
All India	14.13	8.77	4334	9952	2.29

Notes: * – All the values are significant at one per cent level.
Growth rates are computed log linear function.
Source: Computed from CWC (1996) and CMIE (1994).

Electricity Use at National Level

So far the trends and development in the use of electricity in agricultural sector both at the national as well as at different states level have been examined. It is understood that the consumption of electricity in agriculture has been increasing at a fast rate compared to other sectors in the recent period, especially since 1980. Generally, when the number of electric pump-set increases total electricity consumption of the agricultural sector also increases. However, one cannot always assert that a mere increase of electric pump-set will increase total electricity consumption. Working hour of pump-set is one of the key factors which determine the use of electricity. Working hour of pump-set is determined by the availability of groundwater, supply of electricity, cropping pattern of the well owners, development of water market, rate of rainfall etc. When farmers get enough amount of water from well, generally they prefer to go for the cultivation of remunerative water consuming crops.[6] Since water-consuming crops require more amount of water, farmers have to operate the pump-sets for more hours for each turn of irrigation. This will ultimately increase the consumption of electricity in agriculture. Therefore, one has to analyse

6. Since well water is costly compared to other sources like Canal and Tank, farmers tend to cultivate high remunerative crops to make more profit. Incidently, most of the remunerative crops are water-intensive in India.

the working hours of pump-sets, area irrigated by electric pump-sets and the crops cultivated under groundwater irrigation for understanding the electricity consumption. Unfortunately, no data is available for any of these items even at macro-level. Available data relating to electricity use are Net Irrigated Area under Groundwater (NIAGW) and the number of electric pump-sets being used for irrigation purposes. Since electric pump-sets dominate in all the states in relation to diesel pump-sets, it is assumed that the whole groundwater area is irrigated through electric pump-sets for the purpose of calculation.[7]

Table 6: Results of Linear Trend Exercise for Electric Pump-sets and Groundwater Area: All India

Variable	a	b	R^2	N
Pumpsets: (in lakhs)				
1970-71 to 1980-81	–13.74	2.49*	0.99	11
1980-81 to 1990-91	–57.12	4.47*	0.98	11
1970-71 to 1990-91	–27.70	3.35*	0.97	21
Groundwater Area: (million hectares)				
1960-61 to 1970-71	6.19	0.47*	0.92	11
1970-71 to 1980-81	11.06	0.60*	0.98	11
1980-81 to 1990-91	5.09	0.60*	0.98	11
1960-61 to 1990-91	5.53	0.58*	0.99	31

Notes: * Significant at one per cent level.
Source: Computed from CMIE, (1994 & 1994a).

As indicated earlier, the area under groundwater and the number of electric pump-sets are the two main factors that determine the electricity use predominantly in agricultural sector. It is worth noting here that both the electric pump-set and the area under groundwater have increased significantly especially after the introduction of New Agricultural Technology (NAT) (Table 6). For instance, the area under groundwater increased from 7.3 m.ha in 1960-61 to about 24.2 m.ha in 1990-91, an increase of about 3.3 times (Table 7). Within groundwater irrigated area, the area under tube-well irrigation has increased from just 0.14 m.ha in 1960-61 to about 14 m.ha in 1990-91, an increase of about 100 times during the last 30 years of period. That is, in the total NIA, percentage of groundwater irrigated area increased from 34 to 51 per cent during the same period. Since electricity requires to create every hectare of groundwater irrigation, electricity consumption is the agricultural sector has increased tremendously along

Since water-consuming crops require more amount of water, farmers have to operate the pump-sets for more hours for each turn of irrigation. This will ultimately increase the consumption of electricity in agriculture.

with groundwater irrigated area. However, the important point to be analysed here is that why the increasing rate of electricity consumption is higher than the increasing rate in the number of electric pump-set.

Table 7: Growth Rate for Groundwater Irrigated Area and Electric Pump-sets: India

Variable	1960-61 to 1970-71	1970-71 to 1980-81	1980-81 to 1990- 91	1960-61 to 1992-93
Tube Well Area:				
Growth Rate	35.50*	7.99*	4.38*	13.01*
Average (m.ha)	1.80	6.88	12.00	6.62
Other Wells Area:				
Growth Rate	0.83**	1.20*	0.69*	0.89*
Average (m.ha)	7.19	7.82	8.61	7.84
Total Groundwater Area:				
Growth Rate	5.41*	4.24*	2.94*	4.26*
Average (m.ha)	9.00	14.70	20.62	14.77
Electric Pump-set:	NA	10.59*	7.86*	8.87*
Average (lakhs)		26.04	59.06	42.6[a]

Notes: *,** – Significant at one and five per cent level respectively.
NA – not available, a – 1970-71 to 1990-91.
Growth rates are computed by using log-linear function.

As the electricity consumption in agricultural sector is determined by many factors, first the intensity of association of each related factor with electricity consumption is inferred. For this, correlation is calculated by taking certain variables which have some theoretical relationship with electricity consumption using national level data for the period 1970-71 to 1990-91 (Table 8). As expected, the per pump-set electricity consumption (PPEC) is positively and significantly related with the area under groundwater irrigation and the number of electric pump-sets. We also expected that ratio of area under Irrigated Water Consuming Crops (IWCC)[8] to GIA would have a positive relation with electricity consump-

7. Since data for gross area under groundwater irrigation is not available, assuming all the groundwater area as irrigated by electric pump-sets would not make any serious problem in the calculation.

8. Area under irrigated paddy, wheat and sugarcane has been considered as water-consuming crops for analysis.

tion. But, the sign of correlation turned out against our expectation. This could be because of the improper selection of water consuming crops. Since we do not have data on cropping pattern separately by groundwater and surface irrigated area, it is difficult to assume the crops which are cultivated under groundwater irrigation. However, it is clear from the value of correlation that both the area under groundwater and the number of electric pump-sets are positively influencing the per pump-set consumption of electricity.

Table 8: Correlation Values for the Variables Associated with Electricity Use: All India (1970-71 to 1990-91)

Variable Name	Total Electricity Use in Agriculture	PPEC
Tube-well Area	0.94*	0.91*
Other Wells Area	0.87*	0.84*
Total Groundwater Area	0.93*	0.91*
Number of Pump-sets	0.98*	0.95*
IWCC	0.88*	0.85*
Gross Irrigated Area	0.92*	0.91*
IWCC/GIA x 100	–0.34	–0.33
GWA/NIA x 100	0.90*	0.88*

Notes: * – Significant at one and five per cent level.
PPEC – Per Pumpset Electricity Consumption;
IWCC – Irrigated Water Consuming Crops;
GWA – Groundwater Area;
NIA – Net Irrigated Area;
GIA – Gross Irrigated Area.

Source: Computed from CMIE, (1994 & 1994a).

As the influencing variables vary widely, we have computed simple regression for some variables which determine electricity consumption in agricultural sector for the period 1970-71 to 1990-91 to understand the intensity of each variable on the use of electricity. The regression results related to electricity consumption are reported in Table 9. It is evident from table that the area under groundwater and number of electric pump-sets have positively and significantly have influenced the consumption of electricity in agricultural sector. These two variables have also influenced PPEC significantly. For instance, one unit (million hectares) of increase of groundwater area increases about 3399 units (million Kwh.) of electricity in agriculture. Likewise, one unit of increase of GWA increases about 221 unit of PPEC. It implies that when the electric pump-set increases total electricity consumption in Kwh also increases because total electricity use is a function of total working hours of pump-set. This has been clearly observed in the regression results. As expected, the results of the regression analysis show that the ratio of groundwater area to net irrigated area increases in aggregate as well as in terms

Table 9: Factors Determining Electricity Use: Simple Regression Results: India (1970-71 to 1990-91)

Variables	Regression Co-efficients	
	Electricity use (ml. Kwh)	PPEC (in Kwh)
Groundwater Area (m.ha.)	3399.09* (0.88)	221.36* (0.83)
No. of Electric Pumpsets (lakhs)	623.93* (0.96)	40.59* (0.91)
Gross Irrigated Area (m.ha)	1662.19* (0.85)	–
IWCC/GIA x 100	-3579.31^{ns} (0.12)	-234.81^{ns} (0.11)
Ration of Groundwater Area to	3119.15*	205.71*
Net Irrigated Area (per cent)	(0.81)	(0.79)
Cropping Intensity (per cent)	–	214.01* (0.83)
Irrigation Intensity (per cent)	–	250.01* (0.74)

Notes: Figures in brackets are R^2;
* – Significant at one per cent level.
ns – not significant;
IWCC – Irrigated water consuming crops.
Irrigation Intensity (GIA/NIA x 100); Cropping Intensity (GCA/NIA x 100).

of per pump-set consumption of electricity in agriculture. It is true that whenever there is a change in the rainfall, changes are taking place in the area irrigated by surface sources. Needless to that shortages or downward fluctuations in the normal rainfall will increase the exploitation of groundwater. As a result, working hours of pump-sets as well as consumption of electricity will also increase. One can also easily understand from the macro-level data that total electricity consumption has a positive relationship with total number of electric pump-sets. However, it is necessary to understand what could be the reason for the significant increase in PPEC especially in the recent years – PPEC has increased from 3293 kwh in 1970-71 to 5822.7 Kwh in 1990-91 (see Table 10 and Fig. 2). there could be three reasons for the rapid increase of PPEC. Firstly, because of low remuneration in crops like paddy and wheat, farmers in

Table 10: Results of Linear Trend Exercise for Per Pump-set Electricity Consumption (PPEC)

Period	a	b	R^2	N
1970-71 to 1980-81	2200.6	71.3*	0.72	11
1980-81 to 1990-91	–2011.7	251.9*	0.92	11
1960-61 to 1990-91	118.82	131.7*	0.83	21

Note: * – Significant at one per cent level.

Source: Computed from CMIE, (1996).

the groundwater irrigated regions have changed the crop pattern towards high remunerative water consuming crops like Sugarcane, Banana etc. This might have increased the operating hours of pump-set resulting in increase in the per pump-set consumption of electricity. Secondly, because of the continuous over-exploitation of groundwater across the country, water level has gone down sharply.[9] This could have caused an increase in the working hours of pump-set required to irrigate one hectare of cropped area.[10] Thirdly, because of the recent development of groundwater market, farmers owning wells use water not only for their own cultivation but also tend to sell water for non-well owning poor farmers. This has resulted in huge increase in the working hours of pump-set.[11] Besides these reasons, Flat-Rate)FR) pricing policy has also been identified by studies as one of the main reasons for the rapid increase in the working hours of pump-set as the marginal cost of electricity is near zero under FR pricing system.[12] Another strong reason for the rapid increase of electricity in agricultural sector in the recent years is that state electricity boards (SEBs) deliberately dump transmission and distribution losses under head of agricultural sector to show low T and D losses.[13] On the whole, it is clear from the regression results that the area under groundwater and the number of electric pump-sets are the two important factors which positively influence the consumption of electricity in the agricultural sector at the national level.

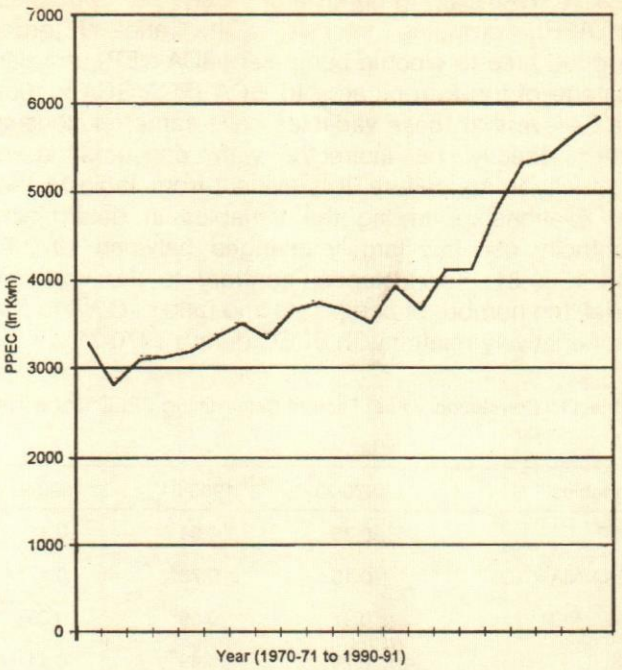

Fig. 2. Per Pump-set Consumption of Electricity: India

Electricity Consumption at State Level

As mentioned earlier, the results arrived at the national level may not be similar with across the state level as the growth of electric pump-sets, area under groundwater etc. are not similar across the states. Therefore, a separate analysis is required at state-level to understand the clear position of electricity consumption. Here, since PPEC shows the real growth of electricity consumption of different state, we have considered only PPEC for analysis and not the total consumption of electricity of each state. At the national level, PPEC has increased from 3924 Kwh in 1970-71 to 5823 Kwh in 1990-91. Between 1970-71 and 1980-81, PPEC has increased only from 3294 Kwh to 3655 Kwh with wide year to year fluctuations. A fast rate of increase in PPEC is observed from 1980-81 onwards at the national level. As far as the state level position of PPEC is concerned, the data show that states like Punjab, Haryana, Uttar Pradesh, Gujarat and Rajasthan have consumed much higher than the national level average during the three periods (1970-71, 1980-81 and 1990-91) considered for analysis. Since PPEC is not the same across the states and the increasing rate is very fast in some states, we have computed correlation and multiple regression for three time points viz., 1970-71, 1980-81 and 1990-91 using the cross section data of 14 major states to understand the factors which determine PPEC at the state level. The variables included in this analysis are: number of electric pump-sets (NEP), percentage of groundwater irrigated area to net irrigated

9. It has been noted that exploitation of groundwater is more wherever electric pump-sets are more. For an elaborate discussion on the magnitude of groundwater exploitation across different states see, Dhawan (1996).

10. A study on the consequences of aquifer over-exploitation related to Tamil Nadu (Janakarajan, 1997) has shown the relationship between water table and consumption of electricity. This study indicates that "the progressive lowering of the water table results in ever increasing pumping depths, resulting in turn in the simultaneous rise in energy consumption. A steady rise in energy consumption per electric operated well in the State stands as the best testimony to the progressive lowering of the water table...." (p. 57).

11. Many micro-level data based studies have confirmed that the introduction of water market has increased the working hours of pump-set. For an elaborate discussion in this regard see, Narayanamoorthy (1994 & 1996); Shah (1993).

12. Reviews related to different tariff policies of electricity and their impact on the electricity use in agriculture are available in Shah (1995); Palmar-Jones (1994); Narayanamoorthy (1997).

13. In this connection, a recent study indicated that "the SEBs know that IPS consumption is lower than what they claim. It has been alleged by researchers as well as ex-officials in power sector, that SEBs dump T and D losses in IPS consumption, to show low T and D losses(...). Metering all IPS will expose high T and D losses, which are a sum of technical losses and commercial losses, such as theft. But for proper running of power utilities, this is all more reason for metering all IPS". For more details in this regard see; Roy (1995), Sant and Dixit (1996).

area (GWA/NIA), groundwater area per pump-set (GWAPP), cropping intensity (CI), ratio of gross cropped area to electric pump-set (GCA/NEP) and percentage of food crops area to GCA (FCA/GCA x 100). We believe that these variables have some relationship either directly or indirectly with consumption of electricity in agriculture. It is evident from Table 11 that the relationship among the variables in determining electricity use has largely changed between 1970-71 and 1980-81. For instance, contrary to the common belief, the number of pump-sets and ratio of GWA to NIA are negatively related with PPEC during 1970-71.

Table 11: Correlation Value: Factors Determining PPEC (State-wise data)

Variables	1970-71	1980-81	1990-91
NEP	–0.35	0.04	0.11
GWA/NIA x 100	–0.15	0.76[a]	0.77[a]
GWA/NEP	0.37	0.59[b]	0.29
CI	0.29	0.49[b]	0.14
GCA/NEP	0.78[a]	–0.02	–0.14
FCA/GCA	0.26	0.11	0.32

Note: a,b – Significant at one, five per cent level respectively.
NEP – Number of Electric Pump-sets;
GWA – Groundwater Irrigated Area;
NIA – Net Irrigated Area;
CI – Cropping Intensity;
GCA – Gross Cropped Area;
FCA – Food Crops Area;
PPEC – Per Pump-set Electricity Consumption.

This relationship is not stable over years especially for 1980-81 and 1990-91. During 1970-71, states like Andhra Pradesh, Tamil Nadu, Maharashtra and Karnataka had relatively more electric pump-sets, but their PPEC is much lower and hence the correlation between NEP and PPEC at all the three time points. It implies that the state which has more GWAPP also consumes more electricity per pump-set. The variables such as CI and ratio of FCA to GCA are also positively related with PPEC. On the whole, the correlation coefficients indicate that ratio of GWA to NIA and GWAPP are the two main factors which positively influence the electricity use in agriculture. These results are almost similar to the results arrived from the national level data. As the increasing rate of PPEC is not uniform across the state and also the factors determining electricity use widely differ across the states, we have computed multiple regression to understand the influence of each variable on PPEC. The following model is used for computing multiple regression:

$$PPEC = a + b_1\ NEP + b_2\ GWA/NIA + b_3\ GWAPP + b_4\ CI + b_5\ GCA/EP + b_6\ FCA/GCA$$

where,

PPEC: Per Pump-set Electricity Consumption (in Kwh).

NEP: Number of Electric Pump-sets (in '000).

GWA/NIA: Percentage of Groundwater Area to Net Irrigated Area

GWAPP: Groundwater Area Per Pump-set (in ha).

CI: Cropping Intensity (per cent).

GCA/NEP: Gross Cropped Area per Electric Pump-set (in ha).

FCA/GCA: Percentage of Food Crops Area to Gross Cropped Area.

The results of multiple regression for the three time points are presented in Table 12. Despite using same variables and the same state for computing regression for the three different years, the regression results are not very consistent between the periods. The co-efficient of GWAPP related to the year 1970-71 shows a

Table 12: Results of Multiple Regression: Factors Determining PPEC (State-wise)

Variables	(Dependant Variable PPEC)		
	1970-71	1980-81	1990-91
NEP ('000)	0.09	1.23	–0.75
	(0.01)	(0.99)	(–0.38)
GWA/NIA x 100	155.76	63.79	98.29
	(4.51)*	(4.23)	(1.84)***
GWA/NEP	–45.73	138.34	781.73
	(–1.98)	(1.73)	(1.62)****
CI	153.91	48.65	4.36
	(3.14)	(3.29)	(0.12)
GCA/NEP	2.93	1.13	–65.39
	(7.24)	(0.40)	(–1.99)***
FCA/GCA x 100	–58.87	–27.97	–20.15
	(–1.26)	(–1.49)	(–0.39)
Constant	–15582	–4775.79	1554.69
	(2.27)**	(–2.20)***	(0.27)
R^2	0.91	0.91	0.77
N	14	14	14
F	12.52	11.83	3.86
Probability of F	0.00	0.00	0.05

Note: *, **, ***, **** – Significant at 1, 5, 10, 15 per cent level respectively.
Figures in brackets are 't' values.
Source: Computed from CMIE, (1994 and 1994a); CWC (1996).

negative relation with PPEC, but the same is positive and significant in 1990-91. Likewise, in 1970-71, the variable GCA/NEP showed a positive and significant relation with PPEC, but the same variable turned out with negative sign in the year 1990-91. This indicates that the determining variables of PPEC are varied between 1970-71 and 1980-81. It is mainly because of the substantial development of area under groundwater and electricity use in most of the states between 1970-71 and 1990-91. For instance, states like, Andhra Pradesh, Orissa, West Bengal, Karnataka and Tamil Nadu had less than 30 per cent of groundwater area to their total NIA in 1970-71, but the position has changed entirely in 1990-91 – most of these states have more than 30 per cent of area under irrigation through the source of groundwater. Some similarities are also observed among the variables that determine PPEC especially between 1980-81 and 1990-91. The co-efficients of the variables such as GWA/NIA, GWAPP and CI are positively and significantly related with PPEC at both time points. This is because of the fact that there were no major changes noticed among the variables which determine electricity use across the states between 1980-81 and 1990-91. On the whole, it is clear from the regression results that ratio of GWA to NIA and GWAPP are the two main factors responsible for the rapid increase in the per pump-set consumption of electricity.

Conclusions

In the present paper, an attempt has been made to study the trends and determinants of consumption of electricity in agriculture for the period from 1960-61 to 1992-93 both at the national as well as at the state level. The study noted that electricity consumption has been increasing at a fast rate in agriculture when compared to other sectors namely industrial and domestic sectors. Growth of electricity consumption is much higher than the growth of area under groundwater as well as electric pump-sets. It is noticed that the rapid increase of electricity consumption in agriculture is mainly because of increase in per pump-set consumption and not merely because of more number of electric pump-sets. The state level results also show that the growth rate of electricity use is higher in agriculture especially in the eighties when compared to the total consumption of electricity in almost all the major states. Results of the regression and correlation analysis show that the area under groundwater and the number of electric pump-sets are the important factors responsible for the significant increase in the consumption of electricity. Consumption of electricity per pump-set is higher wherever the ratio of groundwater area to net irrigated area and the area under groundwater per pump-set is higher. The study suggests that since the relationship between the area under groundwater and the consumption of electricity is highly positive, it is possible to increase the efficiency in the use of electricity by regulating the exploitation of groundwater.

Rapid increase of electricity consumption in agriculture is mainly because of increase in per pump-set consumption and not merely because of more number of electric pump-sets.

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Feature

An Economic Evaluation of Different Methods of Silkworm Rearing

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The present paper evaluates the comparative economics and labour use pattern of shoot and shelf methods of silkworm rearing. The data were collected by using random sampling method from 30 farmers practising shelf method of silkworm rearing in Salem taluk of Salem district and 30 farmers adopted shoot rearing method in Gobichettipalayam taluk of Erode district in Tamil Nadu. The results indicated that 5.72 mandays of male labour and 11.23 mandays of female labour could be saved for rearing 100 Dfls in shoot rearing over shelf rearing method. The revenue generation in cocoon production was also found to be more in shoot method of silkworm rearing.

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Introduction

Sericulture is a labour intensive agro-based rural industry. In India, sericulture is practised intensively in 5 states namely Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu and Jammu and Kashmir. These states contribute together about 98 per cent of the total raw silk production in the country.

The popular method of silk worm rearing in the country is by picking individual mulberry leaf and feeding them to silkworms in the trays which are piled up one above the other in a rearing stand. This method is known as shelf rearing. This traditional method requires high amount of labour for leaf picking, feeding and cleaning. Shoot rearing is an alternative labour saving method of silkworm rearing wherein the last two out of five instars of silkworm are reared by providing mulberry shoots instead of individual leaves, reducing the chances of contamination in silkworm rearing. This method is practised widely in sericulturally advanced countries such as Japan and China. In this context, the present paper analyzes the comparative economics and labour use pattern of shoot rearing with popular method of shelf rearing.

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Methodology

The data were obtained from a survey conducted in Salem and Erode districts of Tamil Nadu during the year

1997-98. Sericulture is practised commonly in shelf method of silkworm rearing in Salem taluk of Salem district, whereas in Gobichettipalayam taluk of Erode district, shoot rearing is a common practice. 30 farmers were interviewed in each area to collect the required information. A total of 60 sericulturists constituted the sample size.

Results and Discussion

Labour Requirement Pattern in Shelf and Shoot Rearings

Silkworm larva in its life period moults four times before entering into cocoon stage thereby the larval period is divided into 5 instars or stages. In the traditional method of shelf rearing, the bamboo or wooden trays are used for the worms throughout the rearing period. While in the shoot rearing method, the larvae are reared in trays upto first three instars by feeding leaf and the last two instars are reared in shoot rearing shelves by feeding mulberry shoots. The labour requirement pattern particularly for leaf harvest and rearing is not uniform in silkworm rearing. The labour requirement especially during last ten days of silkworm rearing (in last two instars) is quite high.

Table 1: Labour Use Pattern for Rearing 100 DFLs in Shelf and Shoot Rearing Methods

(Labour in mandays)

Particulars	Shelf rearing		Shoot rearing	
	Male	Female	Male	Female
1. Cleaning and Disinfection	0.82	1.48	0.73	1.91
2. Young age silkworm rearing (I & II instars)	1.61	2.35	0.57	3.40
3. Late age silkworm rearing (III-V instar)	11.47	28.41	7.08	14.87
4. Mounting and harvesting	3.13	7.18	2.93	8.02
Total	17.04	39.42	11.32	28.19

Table 1 gives the details of the labour use pattern for rearing 100 disease-free layings (approximately 40,000 larvae) in shelf and shoot rearing methods. It is evident from the table that the labour use pattern for cleaning and disinfection, young age rearing (I and II instars) and mounting and harvesting of cocoons was almost similar for both the method of rearings, as the same operations are carried out for both the methods. However, the labour utilized for late age rearing was 7.08 mandays of male labour and 14.87 mandays of female labour in shoot rearing against 11.47 mandays of male labour and 28.41 mandays of female labour could be saved for rearing 100 Dfls (disease-free layings) in shoot rearing over shelf rearing especially during the later period of rearing during which the labour requirement is more in silkworm rearing.

Cost-benefits of shoot and shelf rearing methods

Table 2 gives the economics of cocoon production from one acre for one year in both the methods of silkworm rearing. Cocoon production involves two distinct activities namely (i) Mulberry cultivation and (ii) Silkworm rearing. Since mulberry is a perennial crop, once it is planted, the silkworm rearing can be taken up from sixth month onwards upto 15 years after which the economical production of mulberry leaf starts declining. The costs incurred during the gestation period otherwise called as establishment period were considered as fixed costs and apportioned for 15 years for including in the mulberry leaf production cost. The apportioned cost of establishment of mulberry garden was estimated as Rs. 482.92/acre for shelf rearing and Rs. 891.78/acre for shoot rearing.

Labour was the major input in maintenance of mulberry garden which accounted for Rs. 3,957.83/acre/year for shelf rearing and Rs. 5,917.67 for shoot rearing. Farm yard mannure and fertilizers were the other major inputs consumed for the production of mulberry leaves. The mulberry leaf production cost was worked out to Rs. 9,478.45 for shelf rearing and Rs. 14,157.40 for shoot rearing.

The higher expenditure in the production of leaf for shoot rearing compared in shelf rearing is reflected in rearing more quantity of disease free layings (1103 No.) in shoot rearing than shelf rearing (821 No.) due to the additional production of leaf by the sericulturists practising shoot rearing. Thereby the cost incurred in silkworm eggs was more with Rs. 2,945.23 in shoot rearing compared to Rs. 1,559.27 in shelf rearing. Labour was the major input in silkworm rearing also which amounted to Rs. 12,230.30 for shelf rearing and Rs. 14,318.00 for shoot rearing. Depreciation cost on rearing house and rearing equipments was accounted as the fixed cost in silkworm rearing which was Rs. 3,333.72 for shelf rearing and Rs. 3,806.53 for shoot rearing.

The total cost incurred on silkworm rearing was estimated to be Rs. 20,577.58 for shelf rearing and Rs. 25,903.61 for shoot rearing. The total cost of cocoon production which comprises leaf production and rearing cost worked out to Rs. 30,056.03 and Rs. 40,061.01 respectively for shelf and shoot rearings.

In silkworm rearing, revenue is obtained from sale of

Table 2: Comparative Economics of Production of Cocoon in Shelf Rearing and Shoot Rearing Methods

(Rs./acre/year)

Particulars	Shelf rearing	Shoot rearing
Average mulberry holding (Ac)	1.04	1.70
I. Leaf Production Cost:		
A. Maintenance cost of mulberry garden:		
1. Bullock power	797.00	450.00
2. Labour	3957.83	5917.67
3. FYM	2416.17	2753.33
4. Fertilizers	1233.95	3283.00
5. Plant protection	46.67	72.00
6. Other costs	34.73	38.73
7. Interest on working capital	509.18	750.88
Total maintenance cost	8995.53	13265.62
B. Apportioned cost of establishment of garden	482.92	891.78
Leaf production cost (A+B)	9478.45	14157.40
II. Rearing Cost:		
No. of Dfls brushed	821	1103
A. Variable costs:		
1. Dfls cost	1559.27	2945.23
2. Material costs	11299.73	2095.32
3. Labour	2230.30	14318.00
4. Transportation and marketing costs	1178.50	1487.76
5. Interest on working capital	976.07	1250.78
Total variable cost	7243.86	22097.08
B. Fixed costs:		
Depreciation on building & equipments	3333.72	3806.53
Total rearing cost (A+B)	20577.58	25903.61
Total cost (I+II)	30056.03	40061.01
III. Revenue:		
Quantity of cocoon produced (Kg)	345	518
1. Cocoon	36582.12	57924.00
2. Byproducts	1763.21	3290.53
Total revenue	38345.33	61214.53
Net revenue [III - (I+II)]	8289.30	21153.52

cocoon and generation of by-products such as silkworm litter and leaf wastes which can be used as organic manure after decomposting. 345 Kg. cocoon was produced from one acre which fetched a revenue of Rs. 36,582.12 in shelf rearing. Similarly Rs. 57,924.00 was obtained from the production of 518 Kg. cocoon in shoot rearing and Rs. 61,214.53 for shoot rearing. The net revenue was Rs. 8,289.30 and Rs. 21,153.52 respectively for shelf and shoot rearings.

The real picture of comparative economics of shelf and shoot rearings can be obtained by working out the cost and return structure in rearing 100 Dfls which is shown in Table 3. It is the fact that the labour cost was quite less in shoot rearing with Rs. 1,298.48 compared to Rs. 1,490.28 in shelf rearing. On the other hand, the leaf cost was high in shoot rearing with Rs. 1,283.91, while it was Rs. 1,154.97 in shelf rearing. The cost of production for rearing 100 Dfls was worked out to Rs. 3,256.16 and Rs. 3,287.86 respectively for shelf and shoot rearings.

Table 3: Comparative Economics of Production of Cocoon in Shelf Rearing and Shoot Rearing Methods for 100 DFLs

(Cost/value in Rs.)

Particulars	Shelf rearing		Shoot rearing	
	Cost/ value	%	Cost/ value	%
I. Costs:				
A. Variable costs:				
1. Leaf	1154.97	32.48	1283.91	35.54
2. Dfls cost	190.00	5.34	267.10	7.39
3. Material costs	158.37	4.45	190.02	5.26
4. Labour	1490.28	41.88	1298.48	35.94
5. Transportation and marketing costs	143.60	4.04	134.92	3.73
6. Interest on working capital	118.94	3.34	113.43	3.14
Total variable cost	3256.16	91.51	3287.86	91.01
B. Fixed costs:				
Depreciation on building and equipments	301.98	8.49	324.94	8.99
Total cost (A+B)	3558.14	100.00	3612.80	100.00
II. Revenue:				
1. Cocoon	4457.60		5253.03	
2. By-products	214.85		2968.41	
Total revenue	4672.45		5551.45	
Net revenue (II – I)	1114.31		1938.64	

The increased cost of production in shoot rearing is due to higher wage rates prevailing in the area selected for collecting informaticn from the farmers practising shoot rearing (Gobichettipalayam) compared to shelf

rearing (Salem) and also due to application of more inputs in mulberry garden as well as in silkworm rearing by the Gobichettipalayam farmers compared to Salem farmers. This is evident from the fact that the production of cocoon was higher in shoot rearing (47.05 Kg/100 Dfls) compared to shelf rearing (41.91 Kg/100 Dfls). This indicates that the sample farmers in Gobichettipalayam were more progressive and applying better technologies along with shoot rearing when compared to sample farmers in Salem area. The revenue obtained from brushing 100 Dfls was Rs. 4,672.45 for shelf rearing and Rs. 5,551.45 for shoot rearing. The net revenue was worked out to Rs. 1,416.29 and Rs. 2,263.59 respectively for shelf and shoot rearings.

While looking into the cost structure of cocoon production, it can be observed that 41.88 per cent of the local cost was accounted for labour and 32.46 per cent for leaf production in shelf rearing. Whereas the labour constituted comparatively less share of 35.94 per cent in total cost in shoot rearing. The proportion of leaf cost in shoot rearing was 35.54 per cent.

Summary and Conclusions

The objective of this paper is to evaluate silkworm rearing. The data on the comparative economics and labour use pattern of shoot and shelf methods of silkworm rearing have been collected by using random sampling method from 30 farmers practising shelf method of silkworm rearing in Salem taluk of Salem district and 30 farmers adopted shoot rearing method in Gopbichettipalayam taluk of Erode district in Tamil Nadu.

The results indicated that 5.72 mandays of male labour and 11.23 mandays of female labour could be saved for rearing 100 Dfls in shoot rearing over shelf rearing method. The cost of production of 100 Dfls was Rs. 3,558.14 in shelf rearing compared to Rs. 3,612.80 in shoot rearing. The increased cost of production of cocoon in shoot rearing was primarily due to higher wage rate prevailed in the area selected for collecting information from the farmers practising shoot rearing (Gobichettipalayam) compared to shelf rearing (Salem) despite the labour requirement for shoot rearing was found less than shelf rearing. It was also observed that the expenditure incurred on all the other vital inputs such as leaf, silkworm seed and rearing materials was higher with the farmers practising shoot rearing when compared to the farmers practising shelf rearing. This was reflected in the higher cocoon production of 47.05 Kg/100 Dfls and higher net revenue of Rs. 2,263.59 in shoot rearing compared to 41.91 Kg/100 Dfls in shelf rearing.

It can be concluded that shoot rearing is a cost reduction technology over shelf rearing by saving labour which is the most crucial input which constitutes about 42 per cent of the cost of cocoon production in shelf rearing.

It can be concluded that shoot rearing is a cost reduction technology over shelf rearing by saving labour which is the most crucial input which constitutes about 42 per cent of the cost of cocoon production in shelf rearing. In addition, the shoot rearing reduces the drudgery of labour in harvesting, feeding and cleaning reduces the drudgery of labour in harvesting, feeding and cleaning in silkworm rearing. Hence, the extension agencies should take measures to educate and provide assistance for sericulturists to take up shoot rearing to check the switching over of sericulturists to other competitive agricultural crops because of reduced availability of agricultural labour and higher wage rates. □

Feature

Economics of Agroforestry in Tamil Nadu

T.R. Shanmugam & C. Ramasamy

The present analysis based on a 1995 research project on economics of Agroforestry plantations in Tamil Nadu showed that farmers are motivated mainly by higher return for taking up tree farming besides labour scarcity. Since tree crops are drought resistant, farmers favoured agroforestry. Multiple linear regression was carried out to study the factors influencing the area allocation to agro-forestry.

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Introduction

Agricultural sector sustaining the livelihood of 70 per cent of the population continues to play a key role in the economic development of the population. Food grain production increased to 189 million tonnes in 1994-95 from 51 million tonnes in 1950-51, oil seeds production to 18 million tonnes from five million tonnes, cotton production to 10 million bales from three million bales and sugarcane production to 240 million tonnes from 57 million tonnes during the same period.

In the forestry sector, the demand for wood increased over years due to faster industrialisation and urbanisation. It has been estimated that the demand and availability of raw materials for the paper and pulp industry in the country will grow from 6.3 lakh tonnes in 1991-92 to 15.5 lakh tonnes in 2000 and 46.5 lakh tonnes by 2015. The Planning Commission had estimated fuel wood demand as 343 million tonnes in 1996 and 383 million tonnes in 2001. Similarly fodder demand will be 648 million and 660 million tonnes respectively during the above period. The Forest Survey of India has estimated the maximum quantity of wood that the country can produce annually in reasonably ideal condition as 90 million cubic metre. The area under forest in Tamil Nadu was 21.55 lakh hectares in 1990-91. The per capita forest area in Tamil Nadu was 0.04 hectare as per 1991 census. Protection of forest wealth and afforestation programmes were given priority during 1991-92 and an area of 41,802 hectares were covered under afforestation programmes in Tamil Nadu. During the Eighth Five Year Plan under Sustainable District Forestry Programme, it is proposed to cover 1.05 lakh hectares under conservation forestry, 58,000 hectares under production forestry 66,000 hectares under community forestry and to preserve 123 exotic varieties of plants and 2640 hectares of mangroves. In addition, it is proposed in Tamil Nadu to cover 2.18 lakh hectares of wasteland under different forestry programmes.

Despite the impressive growth, Indian agriculture is characterised by certain weaknesses. The efforts to im-

prove agricultural performance in dry farming areas have not yielded the desired results due to lack of soil and water conservation measures in an integrated manner. Inspite of the good performance in irrigated agriculture, the income of the farmers depending on rainfed farming is very low and uncertain. So their capacity to invest on modern technology and development of land has become slim. In this context integrated watershed development plays the key role in increasing the productivity of rainfed agriculture through appropriate soil and land development practices including soil and water conservation measures and agroforestry based cropping systems.

The efforts to improve agricultural performance in dry farming areas have not yielded the desired results due to lack of soil and water conservation measures in an integrated manner.

Keeping this in view, a research project was undertaken during 1995 in two well defined watersheds of Tamil Nadu. The objectives of the study were:

(i) understanding farmers attitudes and experiences in agroforestry and to assess the extent of adoption of agroforestry.

(ii) to analyse and compare the economics of different agroforestry plantations practised by the farmers, and

(iii) to identify the constraints-resource, technical and development support confronted by the farmers in undertaking agroforestry and the problems faced by the development agencies in implementation.

Methodology

For the present study, two watersheds viz., Sundaranadappu and Kambainallur were purposely selected. The basic characteristic features of the sample are presented in Table 1.

The average size of the sample farm worked out to 1.08 hectares respectively in Sundaranadappu and Kambainallur watershed. Net Cropped area was 274.00 ha in Kambainallur and 216.00 ha in Sundaranadappu. Cropping intensity was high (134.36 per cent) in Kambainallur compared to Sundaranadappu (123.46 per cent). Lower rainfall and failure of monsoon were mainly responsible for the low cropping intensity in Sundaranadappu watershed. The average area under agro-forestry per farm formed 26.85 per cent of total area in Sundaranapaddu and 33.57 per cent in Kambainallur watershed. This indicates that as size of the farm increased the area under agro-forestry also increased in the study area.

Table 1: Characteristic features of sample farms

(Area in hectares)

Particulars	Sundaranadappu	Kambainallur
Number of respondents	200	200
Average size of farm	1.08	1.37
Net cropped area	216.00	274.00
Gross cropped area	266.69	368.14
Total area under agroforestry	58.00	92.00
Area under agroforestry per farm	0.29	0.46

Agroforestry Systems

Sundaranadappu Watershed

A. Agrisilviculture

(i) *Acacia nilotica* is grown in the bunds of paddy field for timber and also in scattered manner or in block at 4m × 2m space. Agricultural crops like sorghum and fingermillet are grown during the first three years as intercrop.

(ii) In clayey soils *Prosopis juliflora* (vellikattan) is grown as a regular tree crop which yields about 300 tonnes in six years. Converting the wood into charcoal enhances the value by 30 per cent.

(iii) Palmirah species are grown either scattered or in blocks in fields or in the field bunds in drylands according to needs of the individual.

(iv) Eucalyptus *(Eucalyptus tereticornis)* is grown either in bunds or as sole crops. It is harvested in seven to eight years and used as poles, timber and oil extraction.

(v) Subabul is the best example for the multipurpose tree and grown in farm bunds and in scattered manner or as fences. Farmers use subabul as fodder, fuel and green manure.

Crops like sorghum, ragi and groundnut are mostly raised as intercrops in between the trees.

B. Silvipasture

In this system Subabul is grown. Bajra Napier grass are grown along with trees. The agroforestry system

commonly followed by the farmers is presented in Table 2.

Table 2: Agroforestry models adopted by Farmers in Sundaranadappu watershed

Name of the Agro-forestry Model	Tree Crops	Agricultural Crops
Agrisilviculture		
(a) Multipurpose trees and shrubs on farm land	Eucalyptus and Subabul	Sorghum Finger millet groundnut and ragi
(b) Fuel wood species	*Acacia* and *Prosopis*	Sorghum and finger millet during first three years
Silvipasture		
(a) Protein bank	Subabul and *Acacia*	Bajra Napier grass

Kambainallur Watershed

A. Agrisilviculture

A distinct feature of this region is the dominance of mango trees due to the well distributed rainfall of 800 mm-900 mm in the North-Western Zone of Tamil Nadu and also by plateau effect. Intercropping of agricultural crops like sorghum, fingermillet and groundnut during the first three years of mango garden establishment is a common feature.

(i) Raising Tamarind *(Tamarindus indica)* either in block or in scattered form is a regular feature. The pods are the main products and used for various purposes. Agricultural crops like sorghum and groundnut, are grown as intercrops in the first three years.

(ii) In areas characterised by rocky shallow soil, where horticultural crops cannot be raised, cultivation of Agave sisalana at 2m × 2m spacing, is a promising alternative since sisal fibre has a market. This is grown in farmlands either as a mixture or in rows along the field bunds.

Castor and horsegram are the annual crops grown as intercrops for first three years of establishment of agave.

(iii) Intercropping in teak is a common feature. Teak is grown with a spacing of 4m × 2m which facilitates intercropping of sorghum and fingermillet for three years.

Karuvell *(Acacia nilotika)* and Velikattan *(Prosopis juliflora)* are common trees in farmlands. They are grown either as pure crops or in rows in farm bunds. They also supply pods which are best fodder for sheep and goats.

B. Silvipasture

(a) Trees and Shrubs on pasture lands: The areas that are not suitable for horticultural crops, supports growth of grasses like stylo.

C. Agrisilvipasture

(a) Multipurpose woody hedge rows: Tamarind is the most preferred species as multipurpose woody hedge row besides Vaagai (Albizzia lebzek) which also gives fodder. The annual leaf yield is about 10-50 kg per tree depending on growth of the tree. Teak is also raised either in village commons or along field bunds.

The agroforestry model generally adopted by the farmers is given in Table 3.

Table 3: Agroforestry models adopted by Farmers in Kambainallur watershed

Name of the Agro forestry Model	Tree Crops	Agricultural Crops
Agrisilviculture		
(a) Tree garden	(i) Mango (ii) Tamarind	Sorghum Fingermillet and groundnut during first three years
(b) Multipurpose trees and shrubs on farm lands	(i) Tamarind	Sorghum groundnut Lab-Lab and ragi during first three years
(c) Fuel wood	(i) Acacia and (ii) Prosopis	Finger millet and sorghum during first 3 years
Silvipasture		
(a) Trees and shrubs on farm lands	(i) Tamarind	Stylo and spear grass
Agrisilvipasture		
(a) Multipurpose woody hedge rows	(i) Tamarind	sorghum and fingermillet

Economics of Tree Cultivation

In order to workout the economics of tree growing, five important tree species were selected in each of the two selected watersheds viz., Sundaranadappu and Kambainallur. The tree species selected and the number of farmers growing that species are given in Table 4. The data regarding cost and return incurred in tree cultivation were collected by way of survey method using the

interviews schedules. Two types of cost are involved in growing trees. i.e. establishment cost and maintenance cost. The former includes preparation of land and layout, digging and fillings of pits, cost of plant material, transportation of seedlings including loading and unloading charges, planting cost, manures and fertilizers, plant protection and miscellaneous costs. The maintenance cost includes manures and fertilizers, irrigation, plant protection, labour and harvesting cost. Functional analysis and Garret ranking technique have been used to study the factors affecting tree farming.

Table 4: Number of farmers growing tree crops

Tree species	No. of farmers (Sundaranadappu)	No. of farmers (Kambainallur)
Acacia	89	74
Prosopis	117	103
Eucalyptus	68	–
Subabul	73	–
Tamarind	–	31
Mango	–	42

To study economic returns from tree crops Net present Value (NPV) and Benefit Cost Ratio (BCR) were estimated using the following method.

NPV = Sum of discounted benefits – sum of discounted costs

$$BCR = \frac{\text{Sum of discounted benefits}}{\text{Sum of discounted costs}}$$

Results and Discussion

Kambainallur Watershed

The yearwise cost of cultivation of selected tree species in Kambainallur watershed is presented in Table 5. The total establishment cost per hectare of *Acacia* plantation is Rs. 15022.60. Pitting and planting formed the major share of about fifty per cent of establishment cost followed by cost of seedlings (21.10 per cent). For establishing one hectare of *Prosopis,* a farmer spends an amount of Rs. 9967.90. Cost of pitting and planting was the major cost in establishing accounting for 63.90 per cent. Like *Prosopis*, tamarind requires low establishment cost of Rs. 9803.80 per ha. Cost of seeds worked out to Rs. 3181.70 followed by pitting and planting (Rs. 3144.70). For establishing one hectare of mango, one has to incur Rs. 19095.80 as establishment costs. The cost of farmyard manure and fertilizers formed Rs. 4000.20 followed by cost of seedling (Rs. 3678.90).

Table 5: Cost of growing selected tree species in Kamabinallur watershed (Rs/ha)

Particulars	*Acacia*	*Prosopis*	Tamarind	Mango
Establishment Cost				
Land Preparation	1062.80	1172.80	1213.60	2486.30
Cost of seeds or seedlings	3176.10	2418.60	3181.70	3678.90
Manuring, pittings and planting	8412.30	6376.50	3144.70	3296.30
After cultivation	2471.40	–	2263.80	5634.10
Total establishment cost	15022.60	9967.90	9803.80	19095.80
Maintenance cost				
2nd year	2655.90	1686.10	2625.40	8123.90
3rd year	2974.60	1888.40	2940.40	9098.70
4th year	3331.60	2115.00	3293.30	10190.60
5th year	3731.40	2368.80	3688.40	11413.40
6th year	4179.20	16434.80	4131.10	12783.10
7th year	21680.70	–	4626.80	14317.00
8th year	–	–	5182.00	16035.10
9th year	–	–	5803.90	17959.30
10th year	–	–	6500.30	20114.40

The economics of the various trees commonly cultivated by the farmers in their land was worked out and presented in Table 6. Apart from the suitability of the soil for raising a tree, it is the cost and return that act as an important factor for taking up tree cultivation. In the case of *Acacia, Prosopis* and Tamarind, one could get good return with minimum after care. This is revealed by the benefit cost ratio of 1.84 for tamarind and 1.74 for Acacia.

Table 6: Economics of tree cultivation in Kambainallur watershed

S. No.	Name of the tree	Life span considered	Discounted cost (Rs.)	Discounted return (Rs.)	NPV (Rs.)	B.C. (Rs.) Ratio
1.	Acacia	7	35355.50	61518.50	26163.0	1.74
2.	Prosopis	6	23778.20	37331.70	13553.5	1.57
3.	Tamarind	10	27331.50	50293.20	22961.70	1.84
4.	Mango	10	76427.90	117716.20	41288.3	1.54

Sundaranadappu Watershed

Table 7 shows the establishment and maintenance cost of different tree species grown by farmers in Sun-

daranadappu watershed. To establish Acacia plantation in one hectare, the farmer needs Rs. 15553.00. The cost of manuring, pitting and planting accounts for 56 per cent followed by cost of seedlings i.e. 21 per cent. Cost of pitting and planting constitutes about 60 per cent of the total establishment (Rs. 9187.90) of Prosopis followed by cost of seeds Rs. 2586.90. Eucalyptus requires an establishment cost of Rs. 20528.90 per ha. Nearly 30 per cent of the cost is accounted for seedlings followed by manuring, pitting and planting (Rs. 8785.40). Farmers who need a multipurpose (fuel, folder, and green manure) tree can go for subabul. The establishment cost per ha worked out to Rs. 17392.10. The economics of the commonly cultivated trees by the farmers of Sundaranadappu was worked out and the results are presented in Table 8.

Table 7: Cost of Growing selected tree species in Sundaranadappu watershed (Rs./ha)

Particulars	Acacia	Prosopis	Eucalyptus	Subabul
Establishment cost				
Land Preparation	1205.60	1234.70	2523.40	2777.90
Cost of seeds or seedlings	3267.20	2586.90	6785.40	4684.20
Manuring, pitting/planting	8684.90	6171.90	8785.40	7284.10
After cultivation	2595.30	–	2434.70	2645.90
Total establishment cost	15553.00	9187.90	20528.90	17392.10
Maintenance cost				
2nd year	2906.70	2178.40	2726.80	2963.40
3rd year	3256.20	2439.80	3044.00	3319.00
4th year	3646.20	2733.50	3420.50	3717.20
5th year	4083.70	2060.40	3931.00	4163.30
6th year	4573.80	14275.80	4290.70	4662.90
7th year	22362.40	–	34734.70	30142.60

Table 8: Economics of tree cultivation in Sundaranadappu watershed

S. No.	Name of the tree	Life span considered	Discounted cost (Rs.)	Discounted return (Rs.)	NPV (Rs.)	B.C. (Rs.) Ratio
1.	Acacia	7	37215.60	60661.40	23445.80	1.68
2.	Prosopis	6	22998.90	34278.00	11279.10	1.49
3.	Eucalyptus	7	46846.70	79173.80	32327.10	1.69
4.	Subabul	7	42654.50	57752.10	15097.60	1.35

This will give an idea about the economic viability of the various tree crops in dryland agriculture. All the tree crops grown have a lifespan of seven years except Prosopis whose life is six years. Eucalyptus has given a NPV of Rs. 32327.10 followed by Acacia (23445.80). Though these two are suited for rainfed area, Eucalyptus has the use by paper mills only. But Acacia comes well even under least care conditions and the pods are fed to sheep and goats.

Factors influencing for shift to tree farming

The farmers take up the cultivation of any crop due to certain reasons. So taking up agro-forestry would have also been influenced by some factors. The factors were identified and ranked based on merit of their importance felt by the farmers using Garatte's ranking technique. The details are furnished in the Table 9.

Table 9: Factors influencing farmers to adopt Agro-Forestry and their Ranks

Factors	Sundaranadappu Rank	Kambainallur Rank
High Income	1	1
Low input costs	5	4
Less irrigation requirement	3	3
Less attention needed	6	7
Less risk	7	8
Have time for other activities	8	9
Labour Scarcity	2	2
Less incidence of pests and diseases	9	6
To meet fuel and wood requirement	4	5
Price fluctuation in crop enterprises	12	10
Absentee landlordism	11	12
Intangible benefits	10	11

This table showed that high income from tree farming was ranked first. This showed that farmers are motivated mainly by high return while deciding the crops to be raised in their land. 'Labour scarcity' was the next important factor to shift from annual crops to agro-forestry. This was mainly because of increasing wages for labour and movement of labour from agricultural sector to non-agricultural sector.

Functional Analysis

To study the factors influencing the area allocation to agro-forestry, multiple linear regression was carried out with percentage of area allocated to agro-forestry (Y) as the dependent variable and the wood requirement in kgs (X1), ratio between per hectare income from agro-forestry and annual crops (X2), income from non farm activities (X3), percentage of rainfed area to

Farmers are motivated mainly by high return while deciding the crops to be raised in their land.

total cultivated area (X4), percentage of area under problem soils (X5) experience of farmer in years (X6), number of livestock (X7), educational level of decision maker (X8) and number of fragments (X9) as independent variables. The general form of the function is specified below.

$$Y = a + b1\times1 + b2\times2 + b3\times3 + b4\times4 + b5\times5 + b6\times6 + b7\times7 + b8\times8 + b9\times9 + b10D + U$$

Dummy variable (D) was used for the watersheds with a value of one for Kambainallur and zero for Sudaranadappu since soil, climate and rainfall are more favourable for tree husbandry in Kambainallur watershed. The estimated regression coefficients are presented in Table 10. The value of R-square was 0.80 indicating that 80.0 per cent of the variation in the area under agro-forestry in the selected farms was explained by the independent variables included in the function. The independent variables relative profitability of agroforestry to annual crops, share of non farm income to total income, percentage of area under problem soils and number of livestock are found to have positive and significant influence. The coefficient of the variables relative profitability of agroforestry to annual crops, showed that an increase in the relative profitability of agroforestry to annual crops, showed that an increase in the relative profitability by one per cent would increase the percentage of area under agroforestry by 0.0074 per cent under *cetaris paribus* condition. Similarly all other variables can be interpreted.

Table 10: Estimated Regression

S.No.	Explanatory Variables	Parameters	
1.	Intercept	$+0.0243^{S}$	(0.0051)
2.	Wood requirement (X1)	$+0.0016^{NS}$	(0.0397)
3.	Ratio between per hectare income from agro forestry and annual crops (X2)	$+0.0074^{S}$	(0.0025)
4.	Share of non farm income to total income (X3)	$+0.0983^{S}$	(0.0096)
5.	Percentage of rainfed area to cultivated area (X4)	$+0.0587^{S}$	(0.0069)
6.	Percentage of area under problem soil (X5)	$+0.0613^{S}$	(0.0074)
7.	Experience of farmer (X6)	$+0.0039^{NS}$	(0.0047)
8.	Number of livestock (X7)	$+0.0084^{S}$	(00.0024)
9.	Education (X8)	$+0.0021^{NS}$	(0.0059)
10.	Number of fragments (X9)	-0.0298^{S}	(0.0049)
11.	Dummy variable (D)	$+0.1732^{S}$	(0.8045)
	R Square	0.8045	
	N	400	

Figures in parenthesis indicate the standard errors
S-Significant at five per cent, NS-Not significant

Income from non farm activities would reduce the dependency of farm households on crop production. Since tree farming has longer gestation period, non farm income would enable the farmers to wait for realising the income from trees. Hence this variable had positive impact on tree growing.

Rational use of rainfed land and wasteland is an important factor in watershed development. Due to its drought resistance, larger income, less risk area, it is natural to expect large area under tree crops in rainfed and problem soils.

Adequate livestock population means less dependance on crop production for subsistence in dry tracts. But livestock enterprise needs green fodder which can be supplied by trees like subsbul. So, number of livestock has positive influence on tree growing. The details are presented in Table 11.

Table 11: Factors limiting adoption of agro forestry

Limiting factors	Sundaranadappu Rank	Kamainallur Rank
Small size and fragmentation	3	3
Lack of awareness & technical know-how	4	4
Long gestation period	1	1
Lack of protection	5	8
Deleterious effect on soil	9	10
Root ill effects on other crops and ground water	2	2
Problems in marketing	6	5
Inadequate finance	8	7
Govt. regulations in cutting and movement	7	6
Lack of location specific tree crop	10	9

Of the factors which limit farmers to go for agroforestry 'long gestation period' ranked first. Most of the farmers are poor. They have to make their livelihood through the income they get from the crops grown. Cultivating tree crops and waiting for seven years for return become a difficult task for resource poor farmers. Seasonal crops provide some return regularly. The next factor is the fear of root effect on other crops and on

underground water. Hence most of the farmers are afraid to take up agro-forestry. This needs large scale education of farmers on the usefulness of tree crops.

Summary and Conclusions

The analysis showed that farmers are motivated mainly by higher return for taking up tree farming besides labour scarcity. Since tree crops are drought resistant, farmers favoured agro-forestry. Multiple linear regression was carried out to study the factors influencing the area allocation to agro-forestry. The independent variables of relative profitability of agro-forestry to annual crops, share of non-farm income to total income, percentage of rainfed area to total cultivated area, percentage of area under problem soil and number of livestock were found to have positive and significant influence. The income from non-farm activities also influenced the farmers to take up tree farming since the non-farm income could help the farmers during the gestation period of tree crops. Rational use of rainfed and wasteland is an important factor in water shed development. Livestock needs fodder and hence livestock population had positive influence. Inspite of the incentives provided to farmers to take up agro-forestry through different programmes, still agro-forestry has not become popular. The analysis of the limiting factors revealed that long gestation period ranked first followed by the fear of root effect on other crops and on ground water. □

Feature

Some Economic Issues in Nation Building: Canada and India

K.K. Kaushik

Capitalist industrialization and spread of a market economy played a key role in aiding and abetting the emergence of nation states in America, Europe and Asia. In this process the twin issues of 'nation building' and 'state building' have become vital for developing countries. It has been realized the problems of geographic diversity and disparities, ethnic and religious conflicts, external influences, etc. have become major factors affecting national integration in vast countries like India. The present author, in this context has examined the social and economic factors with inputs from statistical data, the conditions prevailing in Canada and India. The structure and behaviour of forces working upon nation building in India and Canada have raised several economic issues. With this backdrop, the present paper is a modest attempt to discuss the issues of growth and structural change with focus on regional disparities. Furthermore, it is examined whether earlier consensus on disparities is correct and whether policy measures can be initiated to reduce disparities and ensure steady convergence of regions.

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Introduction

In the mid-1960s, developing countries focussed upon the twin themes of "nation-building" and "state building". Particular emphasis was laid on identifying patterns in the historical revolution of established nation-states which might serve as models of comparison with contemporary process of political/economic development. Capitalist industrialization and spread of the market economy played a key role in aiding and abetting the emergence of major nation states in North America, Europe and Asia (Novek, 1978). Successful national integration and a well defined and a legitimate role for the states are two factors for the emergence of stable political system. The regional, religious and ethnic conflicts, and the problems of geographic diversity and external influence are some of the factors that hamper the processes of forming a sense of national integration in vast countries like Canada and India.

Developmental Scenario

The development of Canada as modern nation state began with the act of confederation, which united three British North American colonies New Brunswick, Nova-Scotia and Canada in 1867. From the founding of the first French colony at Port Royal in 1605 until the British conquest of Quebec in 1759, much of the future dominion was in French hands. The dominion of Canada founded by the act of confederation in 1887 was considerably smaller, in both area and population than the present nation state. Canada's current territory was formally part of the Dominion by 1873 (Jackson, 1986).

At the time of confederation, the population of four member provinces totalled approximately 3.5 million people, eventually increased steadily to over 28.1 million in 1991. Canada depended upon immigration for its very beginning. Roughly 11 million people have entered Canada through immigration since confederation.

One of the traits of nation-state in the 20th century has been seemingly inexorable growth of the role of the state in the lives of its citizens. In the second half of the 19th century, when the Canadian state began to take shape, the role of government was everywhere considerably more limited than today. The initial thrust of state intervention in Canada was primarily economic. The role of the state was originally conceived as one of indirect intervention to provide the infrastructure and other conditions conducive to private sector economic development.

In the second half of the 19th century, when the Canadian state began to take shape, the role of government was everywhere considerably more limited than today.

Canadian State institutions have a long history of state intervention in the economic sector, the development of social policies leading to current welfare state system occurred relatively late. Industrialization and market economy brought a new and aggressive class of entrepreneurs to power, often at the expense of local aristocracies or regional tribal or clan authorities. Structural changes in the economy together with shifting of world markets, inflation and new technologies, threatened the viability of traditional resource and manufacturing industries. The tenacles of market economy grew outward from metropolitan centre to incorporate various regional, colonial and ethnic minorities into one burgeoning economic system.

The structure and behaviour of forces working upon nation building in Canada and India have raised several economic issues. Regional disparities within countries are quite common. Regional equity is a subject whose importance goes beyond the national level: it is a major international problem. The differences in wealth, industrial development, and the standard of living between the "have" and the "have not" nations are a source of world tension, and the advanced economies are shouldering increasing responsibility for trying to improve the position of the poorer nations. With this backdrop, the present paper is a modest attempt to discuss the issues of growth and structural change with main focus on regional disparities in Canada and India.

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Growth and Structural Change in Canada and India

Canada is a land of extremes, in terms not only of territory and population but also of landscapes and climate. Fertile rain forests, arctic barrens, mountains and plains – the variety is as large as the country itself. It has become a clitch to say that nation-building in a land of such magnitude and climatic extremes is difficult. Even with these disparities, Canada is one of the rich elite among the world's nations. Canadians enjoy clean, abundant water, great resource wealth, a plentiful food supply, modern industries, safe cities and good health care and educational facilities. The enormous land mass houses only 28 million people, less than one half of one per cent of world's population. Yet Canada has a population problem not in the traditional sense of over populated countries like India afflicted by high birth rates, but in a demographic sense. Eighty per cent of the territory has never been settled permanently resulting into regional imbalances in population, from congested urban centres to uninhabited wastelands. Only one eighth of territory is suitable for agriculture (Jackson, 1978).

In most respects, development in Canada mirrored that in the international economy. The economy grew larger, it grew richer, and it underwent a significant change in structure. The record was not smooth, though, nor was it uniform. The years from the end of the World War II to sometime in early 1970s were ones of unparalleled growth and prosperity, and of generally satisfactory macro-economic performance. The decade thereafter, by contrast, was one of slower with occasional double digit inflation. Population more than doubled over the same period, rising from 12.5 million in 1947 to 28.1 million in 1991. Services produced 31 per cent of GDP in 1947 and 66 per cent in 1991. The percentage share of agriculture in GDP declined from 5.2 in 1947 to 3 per cent in 1991 (Canadian Statistics, 1994).

In general, the growth of Canadian Productivity is declining; yet, if Canada is to remain high wage economy, it has to be one of high productivity. Annual productivity growth, which had been 2.3 per cent in 1946-73, fell to 0.9 per cent in 1973-90. And the growth of Canadian manufacturing productivity has slowed relative to all the other members of the Group of Seven rich countries. Part of Canada's trouble is its geographical position, next door to the United State; talent is irresistibly drawn away. But that does not explain

everything. It needs more things in which it can excel, more writers like Margaret Alwood, more companies like Northern Telecom. Then it might be able to forget constitution-drawing.

Part of Canada's trouble is its geographical position, next door to the United State; talent is irresistibly drawn away. But that does not explain everything.

India at the time of independence, inherited a highly distorted colonial economy. the commercialization of farm sector in the first half century of colonial rule had led to declining living standards as per capita food production decreased markedly from 202 kg. during 1901-1905 and 152.21 kg. per annum just before independence. During the 50 years of independence of India, this trend was decisively reversed but the figure still stand 187.77 kg. for the 5 years average of 1991-96. Per capita income had remained roughly constant in the first half of this century. According to the census of manufacturing industry, approximately 70 per cent of aggregate industrial development was located in West Bengal, Bombay and Madras during 1945-46.

Planning was essentially conceived to correct this imbalance in India. After an initial spurt of growth in the first three Five Year Plans, the impact of inward looking policies had an adverse effect in the growth process which showed a declining tendency from 4.2 per cent per annum (1950-64) to 2.7 per cent per annum (1965-74). The period since 1975 has seen a revival of a macro economic policy emphasizing investment and growth. The growth rate of 5 per cent per annum (1975-88) increased to 5.5 per cent during (1991-96).

After an initial spurt of growth in the first three Five Year Plans, the impact of inward looking policies had an adverse effect in the growth process which showed a declining tendency.

Significant structural changes have taken place in Indian economy. The share of primary sector in the GDP has progressively declined from 45.77 per cent in 1971 to 28.75 per cent in 1995-96 (both in constant 1980-81 prices). The share of secondary sector has moved up from 22.34 per cent to 29.24 per cent during the same period and the share of tertiary has risen to 42.01 per cent (Govt. of India, 1996-97).

The private sector in India today is better able, in terms of investible capacity as well as managerial capability, to undertake responsibilities which could be the prime concern of the public sector only in the early years of planning. Also market signals are more functional now and the supplies, therefore, show a better response to prices. During the last four decades, the share of public sector in NDP (at current prices) has risen from 7.5 per cent of NDP in 1950-51 to 24.08 per cent in 1992-95 (Nagaraj, 1997), while there was some improvements in poverty related indicators, the magnitude of problems relating to employment and human resources are still forbidding.

Regional Disparities in Canada and India

The regions of Canada have been studied under alternative classification schemes by economists, geographers, and sociologists. The Economist's attention tends to focus naturally on the relative performance of Canada's regions from the standpoint of the economic welfare of their inhabitants. Two indicators income per capita and unemployment rate have been widely used to measure regional disparities in Canada (Anderson,).

No national or international economy can be thoroughly understood without analyzing the regional structure, the nature and functioning of the various regional economics comprising it, their interaction among themselves, and their relationship to the national and world economies.

It is a well recognized fact that material well being of a society depends not only on absolute wealth and purchasing power, but also on their distribution among individuals and families. Family living is subject to returns to scale than individual living. These factors differ from region to region. For example, in 1970 the average Newfoundland family had roughly one more child and one-third less income than its Ontario counterpart, apart from housing, it faced a higher cost of living. These factors explain why Newfoundland is an area of net out migration and Ontario is not.

There is no universally accepted criterion for judging regional disparities, but a vide variety of facts suggest that individual well-being does indeed differ from one region to another. After more than 365 years of settlement people have certainly not distributed themselves uniformally either among or within the provinces. On the contrary, with the exception of centres where local industry is based on natural resources, there is

something of an inverse relationship between density of population and harshness of climate/relative distance from major markets. Though people in such regions are being compensated, yet it has not helped in attracting many people. Even in densely populated regions, disparities of income and opportunity exist. The probability of being rich on poor and finding a job differs even among these places.

Some convergence in income has taken place in the last forty years in Canada. Incomes in all regions have increased significantly over time but the relative gap has narrowed because the incomes of those in the poorer regions have increased faster than those in the regions and provinces that have been better off. For example, in 1955 incomes in the richest and poorest provinces, as a percentage of the average, ranged from 123 and 120 per cent in British Columbia and Ontario respectively (Annual Reference Tables, 1997), down to 49 and 53 per cent for Prince Edward Island and Newfoundland. By contrast, in 1991 British Columbia and Ontario were down to 114 and 118 per cent, while Prince Edward Island and Newfoundland were up to 74 and 73 per cent respectively. In the 1930s Alberta's income per person was 20 to 25 per cent below the national average. In the years 1988 to 1991, its income per person reached the same as that of national average. The lowest income level of all is to be found in Newfoundland, although there is some hope that eventually, when oil prices recover, the oil development in the Hibernia field and improved fisheries outlook may help that province to catch up (Canada Statistics, 1994).

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Table 1 reveals that in 1961, the four Atlantic provinces, Quebec, Manitoba and Saskatchewan received less than the national average, while Alberta, Ontario and British Columbia were above average. In 1981 Alberta was leading followed by Ontario. The four Atlantic provinces, however continued to make progress during the 1961-91 period. Quebec has made remarkable gains in the past two decades and the gains seems to be accelerating. Because of linkages between advantaged and disadvantaged regions, expansion of the more prosperous regions will generate both "spread effects" and "backwash effects" on the less prosperous ones, but the backwash effects will prevail. For example emigration from lagging region will discourage investment there. So the rich regions get richer and the poor regions get poorer, and regional disparities get worse and worse (Savoie).

Table 1: Personal Income Per Capita and Territories, Selected Years 1961-1991: Relationship to National Average

Personal Income $ per person

	1961	1971	1981	1991	1991
Newfoundland	58.2	63.8	64.9	73.3	16553
Prince Edward Island	58.8	63.7	67.4	74.6	16847
Nova Scotia	77.8	77.5	77.9	82.2	18573
New Brunswick	68.0	72.3	71.3	78..8	17778
Quebec	90.1	88.7	93.3	93.1	20988
Ontario	118.4	111.0	107.7	112.5	25386
Manitoba	94.3	94.1	93.0	85.4	19276
Saskatchewan	71.0	80.3	99.5	79.5	17941
Alberta	100.0	99.0	110.2	99.6	22479
British Columbia	114.9	109.0	101.7	101.7	22953
Yukon and North West Territories	96.6	86.8	101.7	115.6	26327 25815
Disparity Gap (ratio highest to lowest)	2.03	1.83	1.69	1.45	1.59
Canada (1961 = $ 1,672 = 100; Current dollars)	100	208.5	720.0	1349.2	22560

Source: Statistics Canada: National Income and Expenditure Account, Catalogue 13-201 and Statistics Canada 1, 1994 (Cat No.11-504 E).

Countries like Canada and Australia whose comparative advantage is obviously in agriculture have tiny fractions of their labour force in that sector, and too many workers in traditional manufacturing textiles (textiles, boots and shoes, metal work) where these countries have an obvious comparative disadvantage. Some developing countries with an obvious comparative advantage in manufacturing have most of their labour force in agriculture. This situation contributes both the unemployment and to high costs and prices, and to protectionist measures in recession which tend to keep prices up without providing more jobs.

Countries like Canada and Australia whose comparative advantage is obviously in agriculture have tiny fractions of their labour force in that sector.

Table 2: Provincial Unemployment rate, Selected Years Relationship to National Average (Canada = 100)

	1961	1971	1981	1988
Newfoundland	275	135	186	210.2
Prince Edward Island	–	–	150	166.7
Nova Scotia	114	113	134	130.8
New Brunswick	148	98	154	153.9
Quebec	130	118	137	120.5
Ontario	77	87	87	64.1
Manitoba	70	92	79	100.0
Saskatchewan	58	56	61	96.2
Alberta	66	92	50	102.6
British Columbia	120	116	88	132.1
Disparity gap (ratio of highest to lowest)	4.74	2.41	3.72	3.28
Canada (1961 = 7.1 = 100 dollars)	100	87.3	107.0	109.8

Source: Statistics Canada: The Labour Force, Catalogue 71,0001 monthly.

Table 2 shows that the pattern of regional disparities in unemployment is as persistent as that of differences in income per capita, and it favours the same provinces/regions, with only one exception; where income per capital is higher in BC than in the prairies. Whenever a region has a smaller than average percentage of its population employed, the level of income per person is reduced. The size of employment base is dependent on many factors. If there is a relatively high proportion of old people of children the employment base will be smaller. In the Atlantic Provinces, the proportion of population of working ages is lower than in Central Canada or British Columbia. This can be attributed in part to the high rate of out migration, as people of working age move to other provinces such as Ontario, where the employment opportunities are better.

Regional Disparities in India

The disparities within developing countries are quite common. The Indian disparity ratio of approximately 1:3 between the most backward and the most advanced states may be easily matched elsewhere. But in India these refer to basic economic conditions rather than to different levels of productivity and income as in Canada. Moreover, such disparities seem to be increasing in India whereas the trend is towards convergence in Canada.

The last six years have seen a renewed interest in growth issues and the concept of convergence (Akkina, 1996) using proxy variables. Whereas Sahay and Cashin (1996) find absolute convergence of regions in India. Since much of the earlier literature (Nair, 1982) on regional disparity in India have shown a tendency (Mathur, 1983) to increase, these results for India are surprising.

Six economic indicators have been taken to measure these regional disparities in 15 major states of India and a ranking scale has been constructed (Rothermund, 1991). Our data base are the census data of 1991. More work has been done on 1971 census data than on the 1981 data as no important structural change has occurred between 1971 and 1981.

There is much debate on the selection and relative weightage of economic indicators. Regression analysis is sometimes used for a more sophisticated evaluation of the data. Since we are aiming only at a rough sketch of regional disparities we are satisfied with a simple index in which the indicators are given equal weight. A five point scale is then constructed so as to arrive at index numbers. Per capita income, which is the indicator most well known, will not be considered here, because it does not reflect the rural urban dichotomy. We have, therefore, selected the following indicators: (a) the percentage of urban population; the respective percentage of the male workforce employed in (b) the non-household industry, (c) the service sector, and (d) in agriculture, (e) the percentage of rural people living below the poverty line, and (f) growth of male worker productivity.

Interpretation of the Indicators

Figures in column 2 and 3 in Table 3 show a close association indicating that industrialized states also have a high share of the workforce in the tertiary sector. These figures show an inverse relationship with the figures in column 4 revealing that industrialized states would have less male workers in agriculture.

To facilitate comparison, these data have been reduced to a five point score (Table 4). As column 4 shows an inverse relation with column 2 and 3, the score has been designed accordingly (i.e. low percentage = 1, high percentage = 5). Similarly, a low percentage of rural poverty is rated highly (column 5) and a high percentage gets five points. Table 5 lists the respective states in the ranking order based on their five-point scores. Column 7 contains the sum of scores of column 2-6. The resulting index provides only a rough estimate of the economic position of those states, but more refined methods would probably not lead to revision of the ranking order.

Table 3: Six Economic Indicators

State	Percentage of urban population	%age of Male workers in			Rural poverty (%)*	Growth of male workers productivity**
		industry	service	agriculture		
Andhra Pradesh	26.89	8	17	65	54	1.10
Assam	11.10	15	18	64	54	0.88
Bihar	13.14	10	10	74	66	-0.91
Gujarat	34.49	23	18	47	43	0.66
Haryana	24.63	18	24	53	27	2.27
Karnataka	30.92	18	17	57	51	1.58
Kerala	26.39	30	27	34	39	0.26
Madhya Pradesh	23.18	14	12	66	64	1.06
Maharashtra	38.68	7	22	54	56	0.97
Orissa	13.58	8	13	63	62	0.26
Punjab	29.55	17	21	54	20	2.94
Rajasthan	22.88	23	14	56	57	1.86
Tamil Nadu	34.15	20	14	56	57	1.11
Uttar Pradesh	19.84	14	4	66	60	1.15
West Bengal	27.48	22	21	50	59	1.05
All India	25.71	18	5	58	68	1.12

Source: Indian Agriculture in Brief 25th edition and

* Satya Paul, "Unemployment in India: Temporal and Regional Variations" Economic and Political Weekly, Vol. XXVII, No. 44, October 30, 1993.

** G.S. Bhalla and Gurmail Singh, "Recent Developments in Indian Agriculture, A State level Analysis" Economic and Political Weekly, Vol. XXXII, No. 13, March 29 - April 4, 1997.

Table 4: Economic Ranking Scheme: The Score

Grade	%age of urban population	%age of Male workers in			Rural poverty (%)*	Growth of male workers productivity**
		industry	service	agriculture		
High	27-31	10-12	25-27	53-59	22-32	3.4-4.1
Moderate	21-26	7-9	21-24	60-64	33-34	3.1-3.3
Average	18-20	6-7	17-20	65-69	45-55	1.8-2.0
Deficient	12-17	4-5	13-16	70-75	56-66	1.4-1.7
Low	8-11	2-3	10-12	76-81	67-74	0.8-1.3

Note: For the immediate stage between 'High', 'Average' and 'Low' the terms 'Moderate' and 'Deficient' have been used.

Four distinct profiles emerge from the listing: (a) modern industrialization combined with high growth of male agricultural productivity and a very low degree of rural poverty (Punjab, Haryana); (b) a high degree of industrialization alongside low agricultural productivity and large scale rural poverty (Maharashtra, Tamil Nadu and West Bengal); (c) industrial and agricultural backwardness with a surprisingly low degree of rural poverty

Table 5: Ranking Order in Terms of Five Economic Indicators

Rank/State	Col.1	Col.2	Col.3	Col.4	Col.5	Col.6	Col.7
Andhra Pradesh	1	2	3	3	3	5	16
Assam	5	1	3	2	3	5	14
Bihar	4	1	5	4	4	5	19
Gujarat	1	1	3	1	2	5	12
Haryana	2	1	2	1	1	2	7
Karnataka	1	1	3	1	3	4	12
Kerala	2	1	1	1	2	5	10
Madhya Pradesh	2	1	5	3	4	5	18
Maharashtra	2	2	2	1	4	5	14
Orissa	1	2	4	2	4	5	17
Punjab	4	2	2	1	1	2	8
Rajasthan	1	1	4	3	4	3	15
Tamil Nadu	2	1	5	1	4	5	16
Uttar Pradesh	1	1	2	3	4	5	16
West Bengal	3	1	4	1	4	5	15

(Orissa, Karnataka and Gujarat); (d) unredeemed backwardness in every respect coupled with rural poverty (Bihar and Madhya Pradesh). Some states do not fit into these categories. Kerala surpasses Punjab and Haryana in most respects, but its abysmal low growth of male worker productivity stands in striking contrast to their high rating in growth of male worker productivity.

As can be seen from Table 6 Assam, Uttar Pradesh and Rajasthan have improved their position in 1991. Bihar and Madhya Pradesh, the most backward states, also have a high score for rural poverty. It becomes obvious from the Table 6 that advancement in the secondary and tertiary sectors does not necessarily 'trickle down' to alleviate rural poverty; it is also seen that relative backwardness in agriculture can go together with low degree of rural poverty, as in Kerala. Kerala has experienced a dramatic reduction of its male agricultural workforce, despite low urbanization and limited factory employment. Only large scale out-migration could explain this fact.

Table 6: Ranking Order in Terms of Five Economic Indicators

	1971	1991
Punjab	8	7
Haryana	8	7
Kerala	10	10
Karnataka	15	12
Gujarat	11	12
Assam	21	14
Maharastha	12	14
West Bengal	14	15
Uttar Pradesh	19	15
Rajasthan	20	15
Andhra Pradesh	17	16
Tamil Nadu	14	16
Orissa	22	17
Bihar	23	19
Madhya Pradesh	21	19

Source: Dietmar Rothermund "Economic and Social Indicators of Regional Disparities in India" in (Eds.) Dietmar Rothermund and S.K. Saha, Regional Disparities in India, 1991.

Concluding Remarks

The present study further corr borates the earlier findings that regional disparities in less developed countries tended to be large and increasing, whereas in more advanced nations they were less and diminishing. The dramatic story of the regional convergence and achievement of one of the world's highest standard of living in Canada is the result of a special kind of "ratchet effect" in regional development. As a consequence of the wide dispersal of good land and other natural resources, the every moving frontier, the extraordinary mobility of the Canadian people, the "frontier spirit" and "rugged individualism", no large regions in the Canada ever slipped from stagnation into decay. Time and again a lagging region was converted into a leading region.

Disparities in unemployment and per capita income are interrelated. Higher unemployment will result in lower per capita income, even if the regional income disparity for those with job is relatively small. Over the past three decades for example, the earned income per employed person in the Atlantic provinces has trailed the national average by less than 15 percentage points, while income per capita has been more like 25 percentage points behind the national average.

Disparities in unemployment and per capita income are interrelated. Higher unemployment will result in lower per capita income, even if the regional income disparity for those with job is relatively small.

These two highly interrelated indicators have serious shortcomings despite the fact that they are easy to grasp. To assess regional differences, other indicators are needed. These two traditional indicators give an incomplete picture of regional economic conditions.

A review of federal regional development efforts points to the conclusion that differences in regional growth rates are caused more by economic factors and less by institutional factors than many in slow growth regions tend to believe.

In India Punjab and Haryana have emerged high agricultural productivity States combined with moderate industrialization and a very low degree of rural poverty. Orissa, Bihar and Madhya Pradesh are the most backward states. Kerala has surpassed many states in most respects but its male agricultural productivity is abysmally low. Given regional disparities as outlined above, what is the future potential for economic development? If the backward states were all set to catch up with more advanced states, the greatest potential for further development would have to be located in the Hindi heartland. At the other end of the scale the economic leaders Punjab and Haryana have reached positions which do not provide much scope for further improve-

ment unless new industries emerge in these two states and generate a great deal of local employment.

Increasing disparities and the concentration of development in a few states could indicate rather alarming political consequences: Will India be torn apart by centrifugal forces? But the three states with the largest potential for further development would generate centripetal rather than centrifugal forces: They need the Indian market for the products of their industries which are mostly not export-oriented and therefore they are also interested in an increase in the purchasing power of the backward states. In the new era of economic liberalization in which India is to be opened to international competition, the task of internal development becomes even more urgent.

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Book Reviews

I See What You Mean: Persuasive Business Communication *by D. Joel Whalen*, Response Books, Sage Publications (P) Ltd., New Delhi, 1996, p. 252. Rs. 195.

This book aptly and creatively titled on Business Communication by Whalen, offers an interesting and useful reading in more than one way.

Bringing forth the various points of view to the reader is Whalen's forte as is evident throughout the book. Solid and clear, as purposeful, he looks for striking instances and examples to substantiate his stance and put it across to his reader.

The discussion on 'Do we need a definition of communication to communicate?' in the chapter, 'Effective Communication' is the most likeable portion of the book where the author makes a bold enough and thought provoking observation that, "professors love to create and use conceptual definitions – it is a great mental exercise. Greater understanding and utility can be found in functional definitions....." The statement signifies the aggressive mode of the book as the author goes on to provide several practical tips on communication oral and written. Everywhere functionality is the buzzword rather than concept drilling as one would normally discover in most of the hooks.

Other interesting and down-to-earth tips of value to business professionals can be found in sections on "Writing Memos", Special Tools for Presentations etc. In the chapter, Writing With High Communication Factor', Whalen nicely deals with some of the 'punches' of communication which probably can impact upon the communication process. Particularly, statements like, "Draw conclusions, Bravely take a stand and defend it confidently", are illuminating. These statements truly are the hallmarks of what this book stands for, what the book wants to communicate to the reader-persuasive business communication.

I would recommend any one, who is in business/organisation with customer focussed approach and who would like communication to steer him on the road to the pinnacle of glory to just take to this book and follow the bagful of tricks offered by Whalen.

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Economic Reforms in India – A Critique *by Ruddar Datt*, S. Chand & Company Ltd., New Delhi, 1997, xiv + p. 352.

This book explores twin objectives: First, to come to terms with the fundamental issues that confront the Indian economy, and Second, to provide an exhaustive account of the issues that have a direct effect on the outcome of economic reforms initiated by the Government of India, particularly since the New Economic Policy declared in 1991. The narratives by Prof. Datt in the book that contains as many as 352 pages is a partial success towards meeting these promises.

The renowned author in the preface assures us that the book would reflect continuity of his thinking on the fundamental issues confronting the Indian economy and would highlight some of the very pertinent issues that are related to the fundamentals. While these are evident from the issues he has covered, their sequencing in the book seems to be somewhat inconsistent. The central focus of the book is also not very clear.

In Part I of the book the author analyses the myth and reality about economic reforms, quoting exhaustively from various issues of the Economic Survey, Ministry of Finance, Government of India. The author comes to the conclusion that the "capital-intensive pattern of

development under the new economic reforms, labour displacement by multinationals .... policies of voluntary retirement and providing golden handshakes in the public sector and the tacit approval to the exit policy have all contributed to contradiction of employment" (p. 21). The issues raised by the author need rigorous and systematic analysis beyond what has been done by him. The entire process of New Economic Reforms has initiated a process of jobless growth .... The capital-intensive path of development, whether with the help of Indian corporate sector or Foreign Direct Investment through multinationals, is responsible for the phenomenon of jobless growth" (pp. 44-45).

The author could have been more analytical in establishing the causal relation between jobless growth seen as a consequence and LPG or NEP as a cause. The ways of generating resources through decentralization and the composition of investment for what may be called job-oriented growth should have been worked out in detail by him while the claim is bold and big. The statement, 'To counter the phenomenon of jobless growth, it would be desirable to reallocate investment in a decentralized pattern so that the benefits of investment percolate to the rural areas rather than getting restricted to metropolitan locations" (p. 64) is repetitive of Part I).

The author has focussed on employment as a basic objective for the Indian economy. In Chapters 3, 4 and 5 the questions related to the role of agriculture, small scale and cottage industries, public sector for generation of employment are discussed. The purpose of chapter 6 for explaining industrial disputes, strikes, lockouts etc is not very clear. Chapter 7 deals in detail with the question of public sector vis-a-vis privatisation.

In the concluding portion of Part I of the book the author brings into focus the role of the state and pleads to the state"to shed soft state attitude towards certain classes which intend to perpetuate status quo and do not permit percolation of the benefits of development to the poor" (p. 168). It is not very clear from the analysis how the state will shed the 'soft safe' attitude and also it is not clear what the alternative scenario the economy of India will offer if the state ceases to be soft.

Part II of the book deals with the size and structure of India's external debt and opines that India has entered into a regime of debt trap:"The performance of the Indian economy in the external sector reveals that both by the debt-service ratio criterion and the current account deficit criterion, India has entered the danger zone which the critics refer to as Debt Trap" (p. 192). In view of the author, "the basic factor responsible for the debt trap is the deteriorating balance of payments on current account" (p. 199). Also, in view of the author, devaluation, liberalization or direct foreign investment cannot succeed unless domestic economy is not improved" (p. 201), where the word 'not' is perhaps a printing error. He cautions in this context that NRI deposits or short term credits from abroad are the areas which cannot be relied upon for long-term investment or even to overcome balance of payments difficulties (p.207).

Part III of the book gives a detailed account of the New Industrial Policy 1991, which could be taken care of in Part I of the book where the author has presented detailed narratives about economic reforms. One reason why the Industrial Policy 1991 is narrated after an analysis on BoP and Debt Trap may be that the author has linked new industrial policy with the emerging debt trap when he says that "excessive freedom to foreign capital will ultimately affect our own economic sovereignty as also push the country into a debt trap further " (p.231). But this link could be established even when the author had introduced 1991 Industrial Policy in Part I itself.

Part IV of the book deals with the Parallel Economy in India, explained in terms of generation of black money through tax evasion and corruption. In view of the author, "New economic reforms which aim at removing controls, undertaking delicensing and encouraging private sector may stimulate growth, but would not be able to reduce the growth of black money effectively" (p. 285). Also, "the political will on the part of the state to control black money is very weak" (p. 285). Corruption is apparently the major factor that not only distorts the functioning of the Indian economy but also makes it structurally weak.

The book contains many issues encompassed by 23 chapters and 3 appendices, a long list of abbreviations and a subject index at the end. In the preface, the author promises to "stimulate rethinking among economists, politicians, policy makers and the general public that it would be unwise to endorse all policies leading to liberalisation, privatisation and globalisation". The book contains many quotations from authorities to support his argument for 'job-oriented growth', if that is the focus of the book. At the level of information, the book is very useful for the general public and politicians in particular. To be useful for economists and serious students of Economics, the book needs to be more analytical. Overall, the effort of the author is a welcome addition to the existing literature on the subject.

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Meat Production and Marketing in Asia and the Pacific *by Dr. D.A. Cruz* (ed.), Asian Productivity Organisation, Tokyo, Japan, 1997, p. 479.

World meat production was about 190 million metric tons in 1994. Of this about 42 per cent consists of pork, 26 per cent each of beef and poultry meat and the remaining was contributed by sheep/goat meat and other meat. While the sheep meat production was stagnant, the growth of beef production was slow and the pork and poultry meat production was rapid. Only a small portion of the meat production was traded globally.

A survey was conducted in 1994 to study the meat production and marketing in nine member countries of Asian Productivity Organisation (APO). Subsequently, the APO organised a symposium during 29 August to 5 September, 1995 to discuss the issues emerging out of the survey. The book under review is an outcome of this symposium. The book has five sections covering Summary, Regional Reports, Resource Papers, Country Reports and Appendices. It focuses on the status of meat production and marketing along with the prospects and problems of meat industry in the Asian countries. The book has documented the regional survey reports on meat production and marketing.

The general increase in income has led to reduction of consumer expenditure on food in the Asian countries except in Philippines. Further there is an increased preference for meat and animal based products. The per capita meat consumption in Asia was 29 kg as compared to the world average of 33 kg. In the Asia-Pacific region, Japan and Republic of Korea have been classified as Beef-Pork-Chicken (BPC) group/countries based on the predominance of these meats in these countries; similarly Republic of China, Philippines and Thailand as Pork-Chicken (PC) group, Iran, Mongolia and Pakistan as Other Meat (OM) group and, India and Bangladesh as Low-Meat (LM) group.

While there has been significant growth in animal population in the region, the number of farm households rearing animals has been coming down. The growth of cattle population in the Asian countries covered by the surveys was less than that of pigs and chickens during the period 1970-1993. This, however, is in accordance with the meat demand. This in a way brings to the fore the structural readjustments in the livestock economy in the region. It is argued that based on the rising trends in animal population, meat production and gross domestic product there is tremendous prospect for greater utilisation of livestock potential in the region. Great strides are possible in poultry sector followed by pig and other sectors.

The meat production in Asia and the Pacific increased generally except in Japan which experienced a decline in pig and chicken production. The growth rates in meat consumption were higher than those of production in these countries resulting in major imports of beef. There were different types of marketing channels for meat marketing and the extent of market margins were different across channels. The data on meat prices as brought out by the book is quite revealing. For example, the retail price of beef was the lowest in India and the highest in Japan. Similarly in India and Bangladesh chicken was more expensive than any other meat. With respect to offals, the utilization was not encouraging and the rate of such utilisation was the lowest in Japan.

The main resource papers by Drs. K. Namikawa, Tomio Murata and K. Ozutsumi have bolstered the cause of the book. These researchers have brought out the need for preservation of genetic resources of farm animals, R&D for beef quality management and potentials for pork production in Japan.It was observed that three principal factors viz. natural environment, needs for farm animals and isolation influenced the Japanese livestock development process.

In the country papers section, status reports brought out by leading academicians, managers of development departments and bureaucrats have been included. There were papers on 12 Asia and Pacific countries which covered the trends in dietary intake, analysis of meat products, livestock status and meat marketing. More details on the dietary intake including vegetables, meat etc. have been given in the respective country reports. Further, the major promotional policies being taken up in the region have been highlighted in this section. For example, initiatives like improvement in cost reduction technology and facilitating slaughter houses in rural areas by China are quoted. Similarly the prospects of meat economy in India in terms of egg processing, diversified buffalo meat production and processing etc. are mentioned.

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Towards Greater Effectiveness of Industrial Research Institutions Some Tools and Trends, *by Amitav Rath,* New Age International (P) Limited, New Delhi, 1998, p. 100.

In the present scenario of globalisation and opening up of the markets, there is a perceptible change in the

approach of Industrial research institutions towards their clients, i.e., the industry. Worldover industrial research institutions were created to serve the industry. With intense competition, due to globalisation and liberalization and also due to the governments gradual withdrawal of financial support, industrial research institutions have to become proactive, in order to be more effective in their services to their clients. In the developing countries, most of the industrial research institutions are publicly funded research institutions. How these research institutions should organise themselves so that their effectiveness vis-a-vis their clients is enhanced. This book has dealt with this timely and important issue which is the concern of most of the research institutions in the developing countries.

The comprises of 10 chapters including References and index. The meaning, purpose, measurement and the need for enhancing the effectiveness of industrial research institutions gets gradually unfolded in various chapters. The author has identified certain group of variables like, inputs, outputs, the type and internal dynamics of industrial technological research institutions (ITRIs) and also the external environment of the institution, as the critical factors to determine effectiveness. To say that a particular research institution is effective, it is very essential to know its objectives and mission. According to the author, for effectiveness of any research institution, there has to be clarity in defining goal, objective and mission against the available resources and also in a particular environmental context for the demand and supply of knowledge. All these factors are interlinked.

Having identified the critical factors for effectiveness, the author has dealt at length, the issue of measurement of these factors. The essential factor which comes out here is the importance of quality of the output and its usefulness to the clients. The synchronisation of the critical factors like input, output, internal dynamics and external environment against the goal and objective is something which a research institution has to achieve, to be effective. Next comes the important issue of evaluation of the performance of these critical factors. In the chapter on evaluation, the author has clearly distinguished different types of evaluations and hence the differences in their approach. Evaluation, very rightly pointed out by the author, has to be specific to the purpose for which it is being done. Hence, in a research institution evaluation has to be undertaken at various stages of an activity. A detailed discussion on various models on evaluation have been presented which gives a clearer perspective on the purpose of evaluation and how it is relevant for measuring effectiveness. The author has also presented a recent guide to ITRIs evaluation developed by International Development Research Centre (IDRC). Examples of different research institutions cited by the author has clearly brought out the focus and importance of evaluation. The most important aspect is efficiency in managing the various activities so that the outcome is effective. This is where the internal dynamics of any research institution becomes relevant.

The author has also discussed the main factors taken into consideration for reorganisation in, some of the public research institutions of the OECD countries. The reorganisation in these institutions is based on-institutional autonomy, decreased public or institutional funding and increased contract and program funding, greater user interaction and feedback and greater attention to utilization. Reorganisation brings in the important aspect of organisational change which is important to enhance the effectiveness and synchronisation of various activities.

Apparently no proper attention has been devoted to the chapter on indexing. Most of the page number mentioned in index are wrong. I am giving just one example- 'Australia: the Review and Reorganisation of CSIRO' in the index the page number mentioned is 49 but actually in the text it is on page 73. This is just one example but I found this to be in almost all the cases. This is very misleading and confusing for any person who depends on index for certain names, issues or topics. But for this lapse (though not a minor one), the book is very relevant and timely for researchers policy makers and R&D institutions.

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Intermediate Micro Economics: A Modern Approach (Fourth Edition) *by Hal R. Varian,* Affiliated East-West Press, W.W. Norton & Company, New Delhi, 1997, p. 650, Rs. 195.

Unlike macroeconomics theory, which has undergone significant changes in recent years, the fundamental elements of microeconomics theory have remained more or less unchanged. One implication of this characteristic of microeconomic theory is that there is usually very little to distinguish one text from other. One important feature of Varian's book is that it extends the application of microeconomic theory to several areas which are traditionally not covered in intermediate microeconomics texts. This way the book is able to distinguish itself from most other texts.

The book introduces the idea of economic efficiency (Pareto efficiency) in the first chapter itself and integrates it with material covered in later chapters. The book has a strong analytical framework offered with clarity. Professor Varian makes extensive use of examples that exhibit the analytic power of the concepts presented. The examples are skillfully integrated directly into the text. The chapter on budget constraint contains an example of the food stamp programme which makes the treatment of the subject very interesting. Revealed preference theory is presented in an abstract form in most texts which students find quite dull. The book also contains, in addition to exposition of the theoretical concept, application of revealed preference theory for index numbers which shows practical utility of the concept. Advanced topics such as inverse demand curves and the Slutsky equation are given with a specific usually reserved for higher level texts for studying tax rebate. In a later chapter, use of the Slutsky equation for calculating the endowment income effect is given. In the chapter on inter temporal choice, this equation is used to decompose the change in demand due to an interest rate change into income effect and substitution effect which is later extended to include cases where price of consumption also changes (i.e. with inflation or deflation).

Chapters 11 and 13 deal with asset markets. Chapter 11 examines the functioning of asset markets under conditions of complete certainty. Chapter 12 and 13 examine individual behaviour with respect to choice involving uncertainity and the functioning of financial institutions such as insurance markets and stock markets and explore how these markets serve to allocate risk. This chapters are highly useful for economics and business students in both second and third years of study.

The concepts of supply and demand curves, elasticity and market equilibrium, which are covered in the beginning in most texts, are covered in chapters 15 and 16 in this book. As an exercise in comparative statics, there is a lengthy discussion of the impact of a tax, which along with examples of the markets for loans and food subsidy, very clearly demonstrates the analytic power of the concepts presented.

Chapter 17 to 27 present the standard material on production, cost and pricing decisions under different market structures including a detailed discussion of price discrimination along with suitable examples. A chapter is devoted entirely to game theory, including repeated games and sequential games.

Externalities present an important complication of he market mechanism. If externalities are present, the market does not necessarily result in Pareto efficient provision of resources. Chapter 31 on externalities shows how other social institutions such as the legal system, or government intervention, that can "mimic" the market mechanism to some degree and thereby achieve Pareto efficiency. This chapter contains a good discussion of the Coase theorem, pollution vouchers and the tragedy of commons.

In recent years economic analysis has become commonplace in legal theory and practice. The book contains a chapter on law and economics which illustrates how economics can be used to analyze the choice of criminal activities and to structure incentives to discourage crime.

Information technology has brought about a revolutionary change in the society in the last two decades or so. This has given rise to the emergence of the information economy as the technological revolution is also an economic revolution. The fourth edition of the book (i.e. the edition under review) has a separate chapter on information technology which is a novelty of the book. This chapter investigates a few economic models relevant to the information revolution and shows how economics can be used to determine the optimal fine for violation of the copyright. Several chapters of the book contain examples drawn from hardware and software industries which goes to underline the importance the information technology theme has been given.

In all there are thirty-five chapters in the book each focusing on a single topic. The emphasis here is to prepare students to do microeconomics analysis themselves.

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Extension System for Livestock Production in Asia and the Pacific, Asian Productivity Organisation, Tokyo, Japan, 1998, p. 157.

In the past livestock development in terms of government priorities received relatively less importance in many member countries of Asian Productivity Organisation (APO) as compared to other sectors of economy such as food crops, education or energy development. Traditionally, there was hardly any semblance of extension programmes on livestock in most of these countries. However, in recent times many Asian and Pacific countries have started to recognise

the potential of the livestock industry as a growth sector. And in order to support the projected growth of the livestock industry, policy makers are now beginning to see the need for livestock extension service to play a more active and significant role.

The present volume under review is a Multi-Country Study Mission Report on Extension System for Livestock Production, organized by Asian Productivity Organisation, which was held at Tokyo, Japan during 28th Feb.–7th March, 1996. The main objectives of this mission were : (1) to assess the current situation of livestock extension in member countries; (2) to apprise the main problems and suggest measures for improving the livestock extension system, and (3) to observe relevant extension activities in the host country Japan.

The report has been organized and presented in four parts.

Part I elucidates the summary and findings of the mission and brings out an overview of the country papers presented by the participant countries and also the papers presented by three resource speakers. Out of the total 18 members countries only 11 countries had participated in the study mission. The countries which presented their papers include: Bangladesh, Rep. of China, Fiji, Hong Kong. India, Indonesia, Islamic Rep. of Iran, Malaysia, Nepal, Pakistan and Thailand.

Part II deals with the resource papers which mainly focus on–Livestock Extension Systems in Asia and Pacific, Livestock industry in Japan, and Livestock Extension Services in Japan.

Uotila, M.E. in his resource paper has observed that, by and large, the agricultural cooperatives in much of Asia And the Pacific, have not been as successful as in some European countries or Japan and China. He further emphasised that the livestock extension service ideally be rendered with and through cooperatives. But he has cautioned that the cooperatives should not be considered as a panacea or cure for all ills that bedevil some businesses. According to him cooperative is just another way of running an enterprise and where they are doing well, they can, and do generate a lot of good will and economic returns.

Moriyama, H. in his paper on 'Livestock industry in Japan', has categorically pointed out that livestock extension system in Japan heavily depends on the concept, that it must of necessity, be a close cooperative scheme among various agencies and institutions involved in livestock development. He further asserted that the Japanese experience in extension service has a lession to share with other countries and that a strong public policy must be made to enable many government/technical agencies to disseminate their output through the extension service which specializes in transmitting technological innovations.

Part III contains the 11 country papers of the participating member countries, where in they have shared their experiences and various approaches adopted in the livestock development programmes. Broadly speaking, some of the country papers have presented a lucid and clear picture of the prevailing livestock extension system in their country, while some lack clarity and have presented a very sketchy picture.

Part IV contains the list of participants, resource speakers, secretariat and the programme of activities during the study mission.

Uotila, M.E., while summarizing the varied experiences and approaches that are being followed in the member countries, has offered some important suggestions as a follow-up measure to improve the livestock extension system.

(1) A livestock information network needs to be urgently established for an easy access to new methods and materials to benefit the extensionists.

(2) Better coordination among the livestock extension agencies is necessary in countries having a multi-agency setup of extension system.

(3) Research institutions and farm universities should include livestock extension into their research programmes and studies.

(4) Women should receive same education, credit, production inputs and extension support as men are receiving.

(5) Livestock extension delivery system should give more emphasis to the actual application of already available research.

(6) Livestock extension staff should be given adequate support and opportunity to undertake appropriate refresher or advanced studies; and

(7) Marketing arrangements, post-harvest loss reduction and intensive livestock production systems, are the three important areas of livestock industry which need to be incorporated in the extension system.

There is no doubt that this report will be very handy and useful to the policy makers, researchers and livestock extensionists. Moreso, all those concerned with livestock management and its further development as

an industry, may find it as a meaningful reference material.

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International Licensing-Managing Intangible Resources *by S. Shiva Ramu,* Response Books, Sage Publication India (P) Ltd., New Delhi, 1997, p. 211, Rs. 350.

The book under review assumes significance especially with the onset of liberalization, globalization and the opening up of various protected economies towards a borderless market. Over the years, the economic analysis of corporations was confined to their physical and tangible assets, such as land, capital and equipment, while the still more progressive ones included assets like human resources as their strength. Here, the author tries to throw some light on the intangible assets, which too are vital and could be exploited beneficially by the companies.

The book is divided into two parts. Part-A deals with the International licensing system, through chapters 1 to 3, covering the nature of the intangible assets, the various intellectual property rights, and the legal system for their protection. Part B is confined to the micro level aspects viz. the licensing process at the firm level. Part B is divided into four chapters (chapters 4 to 7). This covers topics like strategic positioning of a firm, the various alternatives to licensing, the interactional approach to licensing vis-a-vis the licensor and licensee, the various forms and mechanism of technology transfer/knowledge and finally the Indian perspective regarding IPR and its governance.

An introduction to the various types of intangible resources, management of these resources through international licensing and a brief discussion about the benefits accruing to the licensor and licensee through licensing have been given. Three case studies are also given to illustrate the nature of international licensing process. This beckons the reader to read through the book, and dig in for the treasure ahead. Part A has three chapters dealing with the existing International system of intellectual property rights management and protection. Chapter 1 throws light on the potential of the intangible assets of a company, which could be exploited beneficially. Further, it classifies the intangible resources and consequently analyses their nature. The author attempts to emphasize on the need for technological information for a company's survival and discusses the nature of industrial espionage/technical intelligence process. It also goes into the various reasons for firms to go in for licensing, and the various kinds of technology transfer. The case studies and graphical and tabular illustrations make the reading more interesting and absorbing.

Chapter 2 deals with the different types of Intellectual Property Rights, their nature and application, and the impact of IPR piracy. Four case studies dealing with Trademark/Patent violations are also discussed here. This chapter is also peppered with some statistics regarding the US patents issued to foreigners, percentage of software pirated etc. Specific cases of copyright and piracy in China and India are also given a close scrutiny.

Chapter 3 details about the legal system concerning IPR. It further goes on to analyze the various patenting systems with specific emphasis to that of US and Japan. Further, an attempt is made to encapsulate the various international agreements towards the single objective of IPR protection. This helps to create awareness in the reader about the various regimes involved in the international licensing of the intangible resources.

Part B of the book is concerned more with the specifics of licensing process at the micro level. Chapter 4 discusses at length the licensing behavior of firm, the alternatives to licensing viz., FDI, joint venture and their comparative analysis. An analysis of the relation between the nature of knowledge and transactions of firms; and the various types of co-operation based on the capability of partners, is attempted here. Chapter 5 is a relatively small chapter, which highlights the interactional approach between the parties, at various stages of licensing; considering simultaneously the cultural factors, resources employed and the duration for which the transaction is envisaged.

Chapter 6 discusses on the various forms of knowledge transfer and the mechanisms adopted. It also looks into the strategies adopted, especially by the MNCs, towards licensing and the differences between inter firm and intra-firm licensing. Chapter 7 is the final chapter, where the author summarizes the various Intellectual Property rights, their protection and management in the Indian context, thereby making the book relevant to the Indian environment. Here the various modalities and procedures regarding various Intellectual Property Rights in vogue are also discussed. This chapter also discusses the Technology acquisition modes from the view point of a licensor and a licensee in the pre New Industrial Policy (NIP) period and post NIP period too.

In short, this is a book which is well presented, guiding even a novice through the various aspects of the intangible resources, their potential and the various forms and mechanisms for the beneficial exploitation of these intan-

gible resources. It could very well be recommended as a basic guide for management students, and to anyone who is interested or would like to be involved in the management of the various intangible resources.

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Appropriate Use of Inputs for Sustainable Agriculture edited *by D.A. Cruz*, Asian Productivity Organisation, Tokyo, Japan, 1997, p. 293.

The book is based on the seminar on Inputs for Sustainable Agriculture organised by the Asian Productivity Organisation (APO) and hosted by the Government of Japan was held from August 27 to September 6, 1996. Thirteen participants from 12 member countries and seven resource speakers participated in the seminar. The objectives of the seminar were to: (i) assess the current status of applying inputs for sustainable agriculture in member countries; (ii) identify and appraise issues and problems in inputs for sustainable agriculture; and (iii) exchange information and lessons on the subject among the participants. The book is divided into four parts. In Part-I, the summary of findings is given, Part-II contains seven resource papers, Part-III has 13 country papers from 12 countries and appendices are given in Part-IV.

Dr. Del Rosario in the resource paper reviewed the experience of some countries in the Asia-Pacific region related to sustainable agriculture. She pointed out that relative to other environmental issues such as deforestation, urban migration and soil and water resource conservation, fertilizer and pesticide issues are not as serious as reported.

The large profit enabling them to enlarge their land holdings by consolidating the farms of small non-adopter through purchase or tenant eviction. Although new farm technology and green revolution augmented agricultural productivities, these resulted in polarization of rural communities in the large commercial farms and increase in the number of landless farmers.

Noriharu Ae indicated in his resource paper that the major constraint of crop productivity in the semi-arid tropics (SAT) like India are water scarcity and poor soil fertility. The choice of crops, therefore, that would respond favourably under SAT conditions are critical. Dr. Nobuo Tezuka in his resource paper on 'Biological Control of Plant Diseases' stated that for more than 30 years attempts have been made to use biological control agents for plant disease control in Japan but not as much success was achieved as when using agricultural chemicals.

Cr. Hirai in his resource paper reported on the rapid development of agriculture in many Asian countries that has led to serious problems of environmental conservation due to high utilization of inputs such as mineral fertilizers, synthetic pesticides and farm mechanisation. To cope with this problem, agricultural development policies have been focused since the 1980s on facilitating the promotion of biological control through Integrated Pest Management (IPM) so as to reduce the application of agro-chemicals. Dr. K. Minami in his resource paper emphasised that the concept of sustainability emerged as a goal in the new directions and a general consensus that agriculture sector should play a key role in correcting environment problems resulting in a paradigm shift in getting agriculture moving towards the next century. In fact, the focus of this attention was to develop technologies which are based on sound management and conservation of natural resources.

Dr. Xuan in his resource paper discussed about the case of Mekong Delta of Vietnam and reviewed the fate of the erstwhile green revolution experience in general. He contends that the promises of the green revolution in world crop production did not meet the expectation of the hungry population nor alleviated poverty. The argument of the author has wider policy implications.

Dr. R. Kada in the last resource paper of book highlighted that the sustainable agriculture should contain ecological soundness, economic viability, social justice and humaneness. While per capita crop land is declining worldwide, the use of mineral fertilizers has increased five-fold. Due to liberal government policies, higher than optimal application of chemical fertilizers and pesticides are observed with an inevitable impact on surface and groundwater pollution.

As far as country papers are concerned, an important issue which was given great attention by all the participants was the use of organic fertiliser. The use of organic materials to provide the required plant nutrients and protection is indeed very relevant to the current discussions on sustainable agriculture. For instance; IPM which could be described as technically feasible, economically profitable, socially acceptable and environmentally sustainable has been widely adopted by many countries as an effective measure to reconcile food security and environmental safety factors. Many of the country papers also discussed the role of high yielding varieties (HYVs) of seeds in increasing the foodgrain production. But most of them have not gone into its in-depth analysis.

The editor could have easily deleted the irrelevant portions from the book. For example, the third paragraph at page 137 does not convey anything regarding Bangladesh's agriculture and input use.

Again there are editorial/printing mistakes which create confusion. The first paragraph at page 146 (country paper of Republic of China) reads like this "As a result, rice cultivated area increased from 564 thousand ha in 1946 to 4589 kg in 1995.

Overall, the book will be useful to the policy makers, administrators, agricultural scientists, farmers and environmentalists.

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Multivariate Statistical Analysis *by Narayan C. Giri*, Marcel Dekker, Inc., New York , 1996, $ 135.

Multivariate statical analysis deals with study of statistical methods for analysis of individuals or objects. The sample data may be heights and weights of individuals drawn at random from a population of a specified type or measurements such as lengths and widths of a particular type of objects selected at random from a population of such objects or measurements of different characters of selected wheat plants of a particular variety grown at a research station for the study of productivity of that particular type of wheat plant. The measurements made on a single individual or object can be collected to form a vector of observations and we can think of the vector as an observation from a multivariate population.

Indian Statisticians have extensively contributed to the theory of multi-variate statistical analysis starting from P.C. Mahalanobis with his concept of Mahalanobis-D^2 for classification (cf. *Statistics and its applications, Ed. B.L.S. Prakasa Rao, Indian National Science Academy, New Delhi (1995)*), S.N. Roy, C.R. Rao and others. Narayan C. Giri has made significant contributions to the theory of multivariate statistics analysis and the present book is based on his approach to the teaching of multivariate statistical analysis course over a long period of time. Even though the author says in the preface that "This book is an up-to-date presentation of both theoretical and applied aspects of multivariate analysis.....", this reviewer notes that the book is essentially for those who are interested in the theory of multivariate statistical analysis. Application of the methods to real world data in this book are few in number.

The coverage of the text material is extensive and mostly up-to-data and self contained. If the reader is interested in the theoretical aspects of various statistical methods of estimation and testing dealing with multivariate data, this book is recommended for study. However, if his/her main interest is in the application aspect of the multivariate statistical analysis, then he/she can look into, for instance, *Johnson, Richard A. and Wichern, Dean W. Applied Multivariate Statistical Analysis, Prentice-Hall, New Jersery (1982).* There are a few minor misprints in the book which a serious reader can easily detect and correct.

This book is extremely expensive to buy for Indian libraries and it is wondered how many Indian students can afford to have it no their desk for study!

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Labour–Management Cooperation–Workers Participation; Asian Productivity Organisation, Tokyo, Japan, 1997, p. 216.

Workers participation is an age old concept, which is still in the neonatal stage with a lot of handicaps. Nevertheless, the activities of the apex bodies like Asian Productivity Organisation(APO) for promoting the concept of workers participation is really commendable. As part of their continuing effort towards this end, APO top forum held in Tokyo, Japan from 11 to 15 November 1996 to discuss the issues relating to labour management co-operation. This publication is the outcome of the conference.

The book under review has given wide enlightenment on the experiences of labour-management cooperation in Asian countries. It is divided in to four parts. Part one deals with the report of the top forum, part two has set out with resource papers mainly based on Japanese experiences on workers participation, part three is concerned with selected papers from seven Asian countries and the appendices are given in the last part. The initiatives of APO for promoting workers participation and the findings and conclusions of the forum are summarised. Although there is tremendous difference in the modus operandi, the need and importance of workers participation has been recognised by almost all member countries.

Eight resource papers, presented by eminent personalities from industry, academia and labour, has been included in the second part of the book. Many of these

papers are prepared on the basis of Japanese experiences. For example, in the first paper the successful restructuring of IHHI (Ishikawaima Harima Heavy Industries Co. Ltd.) through labour management co-operation has been exposed. the author of this paper has also given a brief sketch of the agreement with employees union to substantiate his argument at the end. The second resource paper is a clear explanation of different stages of the growth of labour management relationships in the post war period. At the end of this paper, the author has emphasised that the firm–level industrial relation constitute an important basis of labour–management co-operation in Japan. The author has also predicted that, the significance of labour-management relations will increase in future.

The author of the third paper, as a trade unionist, has briefly recollected the contribution of his union towards labour-management co-operation in Matsushita Electric Company. He has stressed the give and take attitude of the union, which was helpful to guarantee the management the spirit of co-operation. The productivity aspects of labour management co-operation and the role of Japan Productivity Centre(JPC) has been discussed in the fourth paper. The paper has examined the matter from different angles. The data provided are not exhaustive. The fifth resource paper is also an experience sharing of a trade unionist. Here the author has critically examined the success and failures of National Metal and Machinery Union of Japan in the implementation of model code for its "unit unions' in labour-management consultation. The author has pointed out the determination on the part of his union to recognise the pessimistic business environment surrounding the metal and machinery industry. He has also suggested certain principles to be followed by unions, while dealing with corporate policies and strategies.

The sixth paper 'Workers Participation in the Changing Environment: Western and Asian Experiences' seems to be the most important paper in the series. The paper has beautifully presented the Western and Asian experiences in workers participation. In the reminiscence of Western experiences the author has briefly touched up on the workers participation programmes of almost all European countries. Apart from this, he has critically analysed the functioning of Work Councils in Germany. While making the analysis of 'Asian Experiences', the author is reminding us, that a large majority of Asian countries have had recourse to legislation for workers participation citing the examples of India and Pakistan. In the paper, the necessity for industrial democracy as a pre-condition for political democracy in many Asian countries has been suggested. The author has segregated the Japanese experience of workers' participation from other Asian countries, in order to have a more detailed analysis. The Japanese legislation does not prescribe the setting up of Joint Consultative machinery at the enterprise level, as is common in Europe and other Asian countries. The author also mentioned, among others, that the concept of 'Harmony' propagated by their forefathers is the basis of the success in the of labour-management co-operation in Japan. This paper concluded with the advise of the author, that the Japanese sense of 'harmony' could be the objective to be pursued by other Asian societies also. A good number of useful references has been appended with the paper.

The seventh resource paper introduces the Japanese experience in labour management relations during the social and economic changes starting from the end of second world war. The authors' analysis on 'Humanware' technology in the paper is really interesting. The views of Rengo (Japanese Trade Union Confederation) has been presented in the eighth resource paper. The author (Secretary General of Rengo) has suggested, that serious dialogues with management are not only useful but also necessary to fill in gap between two parties. The paper stresses the significance of labour management consultation system, as the Japanese economy is not is the higher economic growth path.

The third part of the book contain nine papers from seven Asian countries. The first among this is an Indian paper titled 'Experience with Worker Participation Schemes'. Unfortunately this paper fails to discuss in detail the various schemes as well as experiences of workers participation in different organisations. Perhaps the author may not be given due attention to cover the non-legislative participatory schemes which are successfully functioning in many organisations. The paper from Republic of Korea, has been a theoretical examination of worker participation schemes. The author has explained different aspects of employee involvement in organisations. Towards end of the paper, the author claims that, presently the Korean companies could achieve a level of employees involvement that is no lower than that in advanced countries by vitalising the labour management council system. There are not much schemes for workers participation in Nepal except certain provisions in the labour legislation enacted recently.

There are two papers presented from Sri Lanka. The first paper shares the experiences of the author with the company "Bogala Graphite Lanka Ltd.' along with a brief description of various labour enactments in the country. There is no proper valuation of the worker participation mechanism in the paper. The other paper from the country has dealt with various aspects of workers' participation in the trade union point of view.

The book concluded with a fourth part in which appendices of the list of participants/resource persons and the detailed programme and schedule of Top Forum are given.

The book is useful for those who are in the field of industrial relations and labour management for reference purposes. The experience sharing in the resource papers may be beneficial for the practising managers and scholars.

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Managing More Effectively *by Madhurendra K. Verma,* Response Books, Sage Publications Pvt. Ltd., New Delhi, 1997, p. 287, Rs. 295 (Cloth), Rs. 185 (Paper).

In today's world of cut-throat competition prevailing in industries there is a tremendous pressure on managers not only to perform but perform more effectively to excel globally. Performance of task and continuous improvement keeping human dignity and values intact is the challenge to Indian managers today. In this situation, the present book has been published at a more opportune time wherein the author has thrown light on effective management and transcended the principles of management usually described in text books by binding the science and art of managing.

Firstly the readers are familiarized with the current management scene in India and its historical development. The author presents new trends in Indian Management including indigenous experiments and innovations. He also gives practical guidelines for improving essential managerial skills such as motivation, delegation, decision making, effective communication, the management of workplace relationships along with self improvement skills like stress management and time management. Stressing the need of possessing competence and character for an enduring leadership role the author asserts that the final test of a manager is his ability to do the right things.

The book has been very well planned in 11 chapters starting with description of current management scene – its concerns and their contemporariety, providing background to the management scene in India to assess the level of professionalism, discussing the meaning of professionalism in management and how professionalism in management and how professionalism can be achieved.

The chapter two entitled 'The Winds of Change' presents the new trends in Indian Management including new indigenous innovations and experiments conducted in various top class companies like perfect Machine Tools (PMT), Mukund Iron & Steel, Modi Zerox, Asia Brown Boweri (ABB), Indian Aluminium (INDAL), Sundram Fasteners, Hindustan Motors, Siemens India, Union Carbide, Philips India, Titan Industries, Cadbury India, Videocon, TISCO, TELCO, Mafatlal, Thomas Cook, Hindustan Ciba Geigy, etc.

The author discusses the challenge of motivation as being the innate willingness on the part of employees to give of their best and to bridge the gap between laboured efforts and inspiration in the chapter three. Here he also shows how motivation can be created and maintained through a balanced integration of rewards, fear manipulation, encouragement and other such factors.

Delegation is very powerful and excellent tools for managing effectively. Its developmental and motivational effects have been very aptly discussed and also it has been shown how delegation can prove to be a powerful instrument for creating and sustaining motivation. By providing the "How to Test your delegation Habits" questionnaire at the end, the usefulness and practical utility of the chapter has been increased manifold. In chapter five Decision Making (decisiveness) as an essential requirement for effective management has been presented and the use of management decision-making for motivation and team-building has been discussed alongwith a questionnaire on"check your Decision-making skills".

No amount of resources, plans of actions or efforts can be made dynamic by managers without the alchemy of communication. Rightly, thus, Chapter six offers practical recommendations on effective communication and stresses on the importance of listing. It also discusses the issue of credibility and how this can be achieved by transparent conduct and suggest pragmatic steps to improve communication and enhance credibility.

There is an ever increasing demand on Indian Managers today in global competitive context to perform better in terms of productive output, qualitative services and effectiveness. This creates not only tensions but heavy stresses at work places. Therefore, it is imperative for managers to know how regulating tensions is a matter of self-discipline and why the external, so-called curative inputs alone do not work in reducing tensions. The chapter eight discusses the above issues

which will help every managers in India to perform effectively by regulating work stresses.

A leader may not be a manager but a manager has to be a leader to be more effective. For a successful and effective manager the two basic ingredients of leadership-competence and character has to be possessed or else adapted. The author very comprehensively explains the significance of competence and character for enduring leadership and offers practical steps to improve competence and character in the last but one chapter on leadership.

At the end of last chapter the author has very aptly summarised and presented a balanced synthesis of the earlier discussions in the book. He has very successfully and effectively discussed how the ultimate test of a manager is whether he has developed the reflexes for doing the right things rather than doing the things right.

The foreword written by Shri Prakash L. Tandon a well known successful and effective manager in the Indian corporate has added the value and importance of the book. There cannot be two opinion about his view that "It is a book to be strongly recommended to all interested in management, and others who would like to widen their knowledge and wisdom about human behaviour, its ideals and achievement in life".

Written in a very accessible style, the book is interspersed with interesting boxed items, self-tests, flow charts, anecdotes, practical examples and quotable quotes. It will readily appeal to executives at all levels whether they are first line executives dealing at the shop floor or top executives occupying leadership positions.

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Women, Population and Global Crisis—A Political Economic Analysis *by Asoka Bandarage*, Zed Books, 1997, p. 396.

The picture of a world torn with conflict, destruction and despair has formed the subject matter in many books but very few give alternative solutions. The present book is different in this context. According to the author, crisis exists when the old is dead but the new is not yet born. Thus we are told that the book aims at identifying the old and envisioning the new.

The book is divided into three parts. In Part I the author presents a critique of Malthusianism and neo-Malthusianism by pointing out the loopholes in the argument that the rapid growth in population is the cause of Global crisis-in terms of environmental degradation, poverty, political instability and gender inequality. Even the environmentalists and feminists working within the mainstream population organisations are found to subscribe to Malthusianism and neo-Mathusianism or that is the population control paradigm leaving untouched the gender, race and class contradictions within the world political economy. It is rightly pointed out that resource depletion and environmental destruction are not fully attributable to rapid population growth but are more due to the production and consumption pattern of the rich than the poor.

In this context the new reproductive rights agenda stressing women's choice, health and human rights is found to be very limited. In the chapter on "The Politics of Global Population Control", the author shows that birth control which was supposed to be voluntary and for enabling women to have the choice in control of reproduction of socially subordinate groups. What is worse, according to the author, is that the contraceptive revolution has enabled external institutions to intervene without much attention to local socio-economic situation and cultures. The health hazards for women of the various types of contraceptive has been vividly brought out.

Part II consisting of Political Economic Analysis deals with the historical evolution of socio-demographic relations, social structural determinants of fertility, political economy of poverty, environment, violence and insecurity. Part III sets out the paradigm shift from domination to partnership.

In the chapter on the historical evolution of socio-demographic relations the author traces the creation of patriarchy to settle farming and agriculture. She connects patriarchy, gender and fertility and shows that fertility behaviour is likely to reflect dominant social class, male and global interests. Lower access to resources in Third World countries and now the implementation of the Structural Adjustment Policies (SAP) which have led to a reversal of social improvements achieved in earlier decades has led to high infant mortality in turn causing higher fertility rates.

The author lauds the achievement of Kerala with regard to demographic transition but it is significant that she issues a warning that there is no guarantee that even Kerala can withstand the penetration of international capital and hold on to its hard won social improvements in the years to come. However, it is strange that when she says that 22 per cent females in Kerala never got married because of better alternatives available to educated women she forgets the fact that unemploy-

ment among women is highest in Kerala as compared to the rest of India.

In Part III of the book the author presents her own alternative in terms of a shift from a dominator to an ecocentric paradigm. She finds a ray of hope in the spontaneous outbursts and organised struggles against the joint forces of transnational capital and the top-down neo-Malthusian population control programme alongwith the revolutionary synthesis that is emerging among different intellectual and spiritual traditions challenging the dominant dualistic and mechanistic paradigm. However, she is also conscious of the local activists being allured by large funds separating them from popular movements they had started.

Communism failed according to the author because it perpetuated the worst aspects of capitalism viz., centralisation, technological dominance, militarism and exploitation of nature and human beings. Yet the left analysis should not be thrown out otherwise environmentalism and feminism is likely to be co-opted by dominant political and economic interests.

The author does not conceal her Buddhist point of view and suggests a Middle Path for overcoming the global crisis. The alternative ecocentric paradigm is to be based on participatory democracy. As an advocate of the Middle Path she does not want the privileged classes to renounce their career ambition but to bring it closer to political activism and be prepared to take more risks with job security, material advantage in exchange for honesty, emotional fulfilment and environmentally meaningful work. To the women her advice is to strike a balance between the traditional role of the self-sacrificing mother and the modern role of the individualist career women.

The book is well documented and has a message but the question is whether the world is ready for it.

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New Books Received for Review

Sherosky, Frank J., 1999. Perfecting Corporate Character: Insightful Lessons for 21st Century Organisations. **Excel Books, New Delhi. 299p.**

Ab: Human nature is the greatest shaping force of corporate performance. Undisciplined, it has always victimized organisational quality. Now, as business plans the future, it can no longer ignore this issue. It must be faced now or we will all be forced to accept its inevitable consequences into the 21st Century. Perfecting corporate character addresses the business quatrain of people, products, processes and profits; and rightly puts people quality first on the business agenda.

Moorthi, Y.L.R., 1999. Brand Management: The Indian Context. **Vikas Publishing House Pvt. Ltd., New Delhi. 171p.**

Ab: Bridging the gap between theoretical aspects of brand management and the reality of the Indian Market, this crisp and compact book covers five essential topics including brand success, brand equity, brand expression, brand personality and brand repositioning. This book targets product/brand managers, senior and middle level marketing managers and post graduate students of management.

Sodhi, J.S., 1999. Industrial Relations and Human Resources Management in Transition. **Sri Ram Centre for Industrial Relations and Human Resources, New Delhi. 374p.**

Ab: Based on case studies of eight companies belonging to four industries, this book attempts to capture developments in the field of industrial relations (IR) and human resource management (HRM) in the wake of competition. The companies belong to both public and private sectors and they represent automobiles, electronic, banking and garment industries. The studies of two large public sector units (banking and electronics) have revealed that it is possible to achieve organisational goals, even when the units enjoy limited flexibility in terms of management policies, provided a package of IR/HRM policies is sincerely pursued.

APO, 1999. Asian Economic Crisis: In Search of Higher Competitiveness in Global Markets. **Asian Productivity Organisation, Tokyo. 138p.**

Ab: The world economic situation surrounding us is characterised by such phenomenal changes as an increasing flow of people and information across national borders, more liberalised trade, investment and finance, and rapid technological advancement. Asian countries were the major beneficiaries from these changes as they have favourably advanced the dynamic stride of their economic growth. Against this background, the APO organized in December 1998 in Tokyo, Japan a meeting on the Asian economic crisis: in search of higher competitiveness in global markets. This publication is a compilation of presentations made by leading experts from Asia, the United States and Europe who provided rich food for thought in overcoming the crisis and revitalizing Asian economies.

Manimala, Mathew J., 1999. Entrepreneurial Policies and Strategies: The Innovator's Choice. **Sage Publications, New Delhi. 336p.**

Ab: While there is a considerable body of literature on both entrepreneurship and achievement motivation, there are still many unanswered questions concerning both these phenomena and the psychological traits and motivations of high achievers. This fresh and unusual study of the phenomenon of entrepreneurship focusing on the innovator's heuristics is based on first-hand observation, interviews, published case studies and an exhaustive literature survey. It provides a novel theoretical perspective on the strategies and policy orientations of new ventures, using an innovative research method which is an easy-to-use but scientifically rigorous version of the case survey method, synthesizing the benefits of qualitative and quantitative data.

Zbar, V., 1999. Managing the Future: Unlocking 10 of the Best Management Books, **University Press, Hyderabad. 129p.**

Ab: Managing the Future sketches the current dramatic changes in Management and Organisation Theory in the private and public sectors. It pinpoints the emerging trends by providing a concise executive summary of the very best groundbreaking books written by the trendsetters. The book takes the form of a sampler of 10 recent management books. This is an excellent taster's guide. Succinct, neatly structured and easy to use, it outlines the most exciting recent trends in management thinking.

Pestonjee, D.M., Pareek, U. and Agrawal, R., 1999. Studies in Stress and its Management. **Oxford & IBH Publishing Co. Ltd., New Delhi. 332p.**

Ab: In recent years, there has been an upsurge of interest in the study of stress and its management. The present volume brings together leading researchers in the field of stress. Each author focuses on recent research findings, theories, methodological issues, and action plan for coping with stress that are relevant to individuals and to organisations. This comprehensive coverage of both critical issues and central topics will make the present value essential reading for psychologists working in industrial, occupational and clinical settings, together with managers, research scholars, OB and HRD professionals.

Murthy, D.B.N., 1999. Managing Quality: A Practical Guide to Customer Satisfaction. **Response Books, New Delhi. 226p.**

Ab: With the emerging globalization and availability of quality products and services, it has become imperative for organisations to focus on customer satisfaction as a strategic business objective. This book is a practical guide for the implementation of holistic quality management practices to achieve total and continuous customer satisfaction. Divided into 14 chapters, the book provides a judicious blend of select techniques and philosophy for quality management. The author stresses the importance of the management taking the lead to ensure quality in organisations. Emphasis is also placed on training and motivation in order to inculcate among employees the desired attitudes towards quality.

Wise, R.D., 1999. New World Series: Oil in the Global Economy; Transformation of the International Oil Industry. **A.P.H. Publishing Corporation, New Delhi. 189p.**

Ab: Few events have brought about such a radical change in the world energy scene and are as important for the understanding of power and wealth concentrations within contemporary capitalism as the two stocks that shook the international oil industry during the seventies. In the aftermath of the sudden increases in crude oil prices that occurred at that time, it soon became apparent that the oil industry was undergoing an outright revolution which upset its former structure, modified what had been the main parameters of its growth prior to that point, opened new and different development opportunities for industry participants, and in general provided the development of the entire oil sector with a new trajectory.

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EDITOR: RAMA J. JOSHI

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