Toward a New Production Sensibility

The Impact of Economic Liberalization on Regional Industry:
The Case of Tamil Nadu, India

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Policy Summary:

The key challenge facing Tamil Nadu’s industries as the economy opens up to greater competition with the adoption of WTO rules in the next four years, is to develop the capacity to compete with both, low cost as well as high quality producers in the liberalized domestic and export markets. To succeed in this environment, Tamil Nadu’s firms will have to compete on the basis of cost as well as quality, speed, consistency, timely delivery, improved production processes, and increased product variety. To be able to produce goods and services that are valued at home and abroad, and to do so at reasonable cost, local firms will need to improve their productivity, restructure their production technologies, upgrade the capabilities of their workforce, and increase private and public investment in manufacturing, service delivery, high quality infrastructure provision, and research and development.

This has several implications for public institutions, and how public policy might help firms improve their capacity to compete at home and in overseas markets. The macroeconomic policy reforms, and efforts at bringing more market like pressures to bear on the public sector through privatization are an important part of the story; but they are not enough. Market reforms will not automatically, by themselves, lead to improved industrial competitiveness. New institutional arrangements and innovative organizational practices will be needed, in addition to market-oriented reforms, to increase the productivity of both industry and government, and to help local firms acquire the skills, resources, capabilities and knowledge necessary to compete more effectively.

Three sets of key policy implications follow from this perspective:

1. Improving industrial productivity, profitability, and adaptiveness

The importance of building upon historical advantages to develop a dynamic, and diversified industrial base: Tamil Nadu’s greatest opportunity lies in its core strengths: strong manufacturing capabilities in areas like engineering, textiles, leather—which currently form its largest employment base; a high quality workforce with a large segment of workers trained in science and technology, and a strong R&D tradition. It is important that Tamil Nadu build on this base as it modernizes and diversifies into new growth sectors. It is critical to view modernization as involving five key elements.

(a) Improving productivity in both, the high-end, as well as labor intensive sectors of the state’s economy through a variety of means including export development, improved market penetration, and the use of international production standards as a lever of change.

(b) Strengthening the entire supply/production chain in each sector, rather than focusing narrowly on individual firms or subsectors. This will often mean blurring the boundaries between what is traditionally regarded as manufacturing and what is viewed as services: the improvement of production capabilities in each sector will also require the upgradation of the firms that provide key services to those sectors (e.g., design and development, distribution, packaging, finishing, banking, communications, venture capital, testing, input supply and so on).

(c) Providing high quality collective services such as infrastructure including electric power, logistics, transportation, serviced land, and telecommunications that will benefit both, the old and new industries by lowering the costs of doing business in the state.

(d) Viewing innovation as the basis of long-run industrial growth, rather than merely low costs;

(e) Shaping the competitiveness of the new growth sectors (such as high-technology industries and information technology) through: (i) technology development, (ii) industry-relevant research and development in collaboration with local universities, (iii) creation of regional “centers of excellence” throughout the state, (iv) the development new worker skills appropriate to the needs of these high
technology sectors; and (v) constant evaluation of the progress of the new sectors through: benchmarking, comparisons with Tamil Nadu’s goals as well as with outside practice, and continuous improvement through ongoing exposure (of firms and public institutions linked to these sectors) to outside markets and user demand.

2. Creating institutions of upward mobility and institutions of mediation to minimize the dislocation that restructuring is bound to generate

The process of upgrading Tamil Nadu’s production base, as described above, has the potential to fundamentally revitalize the region’s industrial competitiveness, turnaround long ailing sectors of the economy, and improve its capacity to compete at home and abroad. But this same process of restructuring is also bound to bring in its wake significant dislocations that may exacerbate existing inequalities, and if ignored, worsen poverty among those excluded from the new dynamic sectors. It is vital that the government of Tamil Nadu craft policies that diffuse as widely as possible the benefits of the new industrial economy across space and across classes. This can be done by creating institutions of upward mobility that will allow the government to leverage market reforms to boost industrial dynamism, and work to simultaneously counter the regressive and polarizing impact of trade liberalization on regional industry.

(a) Tamil Nadu’s industrial strength cannot rest on isolated pockets of prosperity, or on the fortunes of one or two priority sectors. While not all sectors, and regions will benefit equally from the growth process, it is important to emphasize policies that maximize spillovers, enhance backward and forward linkages, provide collective services that benefit firms of different sizes and sectors, and create production linkages that help diffuse new technologies between firms of different sizes.

(b) It is important that industrial upgrading occur in ways that do not create needless dichotomies between high-value added and low value added sectors, or between exports and production for the domestic market, high skill vs. low skill tasks or between standardization and customization. The key challenge is to diffuse a new production sensibility across firms that focuses on productivity, concern for quality, consistency, economizing on costs, and responsiveness to the needs of customers, and applies to all sectors, irrespective of whether they are high and low-value added.

In this regard, it would be important to:

(c) Foster the creation of a strong, middle tier of intermediary firms as a way to anchor outside investments locally, and diffuse industrial growth more broadly.

(d) Create deliberative institutions that will generate local learning about what works and what does not and why, and diffuse this knowledge across sectors;

(e) Create institutions of conflict resolution that will help facilitate collaboration and collective action among competing parties to meet stringent outside standards, or come to joint agreement over divisive issues—such as rules to protect intellectual property rights, compliance with international trade protocols and so forth.

(f) Increase public and private investment in training programs that upgrade the skills of production workers to the next level; and produce a strong tier of managers who are well versed in the new production techniques and the challenges of the new competition.

(g) Focus on exports, and simultaneously cultivating the domestic market. Even as Tamil Nadu promotes export-oriented manufacturing as a priority area, it is critical that non-exporting domestic firms that are unable to get in on the support that export oriented firms get from government do not go under in the face of cheaper imports due to inadvertent policy neglect.
(h) Move away from a social welfare-based approach to small firms, toward an approach that encourages the diffusion of productivity enhancing production practices across small firms through cluster development, inter-firm linkages, and the fostering of “mentoring” ties between small firms, large firms, and public institutions.

(i) Improve the image of Tamil Nadu as a strong and rising industrial power by showcasing credible and concrete results in terms of improved productivity, and the role in it of a responsible, transparent, reliable and investor-friendly government.

3. This would involve deepening and strengthening the new dynamism within the public sector through a continuation of its innovative administrative reforms.
Introduction

Tamil Nadu, like other Indian states, stands at a time of critical transition. Since the Indian economy opened up to freer trade in 1991, Tamil Nadu has sought to put in place a new policy regime to boost industrial production, improve the state’s infrastructure, attract large scale foreign investment and spur employment. Since the mid-1990s in particular, there has been evidence of quite dynamic reform in the way in which the Tamil Nadu government has sought to harness the new economic openness to improve industrial performance. But much remains to be done; and a new challenge looms directly ahead. By 2004, Tamil Nadu, like other states in India, will have to make further, dramatic cuts in trade protections, tariffs and subsidies in several key industries to comply with the WTO schedule of tariff reductions. In some sectors, firms will face freer trade in less than two years.¹

As the economy opens up further under WTO rules, Tamil Nadu’s firms face three key challenges. First, they face much greater competition at home, in the domestic market—from cheaper imports on the one hand, and from better quality, higher value-added imports from advanced industrial countries, on the other. Second, to succeed, firms will have to increasingly compete in the international market. Entering the international market will not be easy, particularly for firms whose production strategy depended upon the old protections of the Indian market. The key challenge facing firms is how to break out of bottlenecks that have stymied productivity in the past, and meet international production standards to successfully penetrate overseas markets.

Finally, the international economy in which Tamil Nadu’s firms are beginning to compete today, is itself dramatically different from previous decades. What it takes for a firm to compete successfully in the international economy today is starkly different than in previous periods. In contrast to the stable markets of even a few decades ago, the international economy today is much more volatile and unpredictable. It demands much higher standards of product quality, much greater product variety, compliance with tough environmental and (increasingly) labor standards, rapid delivery and quick turnaround times. Rapid technological change, shortened product cycles, massive FDI flows across countries, and an intensely competitive environment have all produced a new geography of production where growth is increasingly based on innovation and new cross-border alliances, rather than low costs alone. To compete successfully in this world, therefore, Tamil Nadu’s firms will have to compete both, on cost, as well as on quality, consistency and quick delivery times.

¹ In the case of textiles, for example, even though the Multifibre Agreement (MFA) and the Agreement on Textiles and Clothing (ATC) are set to expire at the end of 2004, some product categories in which the US and Europe compete, will be liberalized by 2002; and many products in which Indian firms compete will see freer trade a year later (Chandra 1999, WTO website).
What specific changes will Tamil Nadu’s firms need to make, then, to adjust to this new, more open competitive environment, and how might public policy help firms to transform and reorganize themselves in this process of adjustment? This is the first of four papers in which I address some of these questions. This paper focuses broadly on the crosscutting themes and issues that are significant in thinking about the process of industrial restructuring in Tamil Nadu. It also examines (in a preliminary way) the new sources of dynamism in Tamil Nadu’s industrial sector—especially in terms of what public agencies are doing differently to cope with the challenges of economic liberalization. It highlights innovative practices and instances of good governance from within Tamil Nadu, as well as draws upon the experience of other countries that have successfully liberalized to gain insights about international best-practice, and the lessons that Tamil Nadu may learn from these examples.

The next three papers will report on the results of a field-based investigation of three of Tamil Nadu’s key sectors, covering both the high and low ends of the region’s industrial structure. These sectors are: engineering (including software) at the high end, and textiles/apparel, and leather/leather products at the traditional, labor-intensive end. The field-based industry studies (to be conducted over Spring 2000) will examine the emerging trends, core strengths, and challenges faced by these industries as Tamil Nadu opens up to greater international competition through progressive compliance with WTO rules, and further liberalization.

**An Institutional Focus**

The debate on WTO is, at one level, a debate about the adoption of market reforms. The central argument of this paper is that the market reforms adopted by countries like India and states like Tamil Nadu are a first step in an important and necessary adjustment process aimed at removing excessive state regulation and growth-inhibiting price distortions of years past. But, market-oriented macroeconomic reforms are not by themselves enough to achieve broad-based industrial growth, and will not automatically result in improved industrial competitiveness. There are far too many examples of countries that have adopted successful market reforms but achieved little by way of industrial growth. In addition to liberalization,
therefore, *improving industrial competitiveness will require a deeper process of institutional transformation*. Whether or not market reforms lead to dynamic, and adaptable industrial growth will depend crucially on the nature of the institutions—of production and governance—that Tamil Nadu produces, and the extent to which these institutions work with the market to improve the capabilities, effectiveness, and productivity of both firms and government.

Tamil Nadu has already made some bold beginnings in this reformist direction. During my field-visit to Chennai in August 1999, I was struck by the extent to which some of the best ideas and the more dynamic sources of institutional restructuring and policy reform were coming from within the state government itself. This paper uses the Tamil Nadu experience of policy reform to focus on the micro-regional institutional environment within which the State’s industrial adjustment is occurring, and asks how do you leverage the market to achieve industrial growth based on innovation without fueling a race to the bottom.

**The Tamil Nadu Context:**

In a comparative study of industrial development in Tamil Nadu, Maharashtra, and Gujarat, conducted six years ago, Padmini Swaminathan (1994) found that of all three states, Tamil Nadu lagged the furthest in industrial development. She found that this was in part because private firms in Tamil Nadu took less risks compared to firms in the other two states, but more importantly, she found that this was because in contrast to the far more proactive, business-friendly, and pragmatic governments of Gujarat and Maharashtra, the Tamil Nadu government had not created an environment that was dynamic, or conducive to profitable risk-taking. The government in Tamil Nadu, Swaminathan argued, lacked industrial leadership: “[w]hat is needed…is the presence of a particular quality of leadership and a certain aggressiveness in converting disadvantages into opportunities. At present the interaction between government and industry is at a very superficial level which prevents the fruition of any objective…” (Swaminathan 1994: M-74).

In recent years, this picture has changed dramatically. By the summer of 1999, when I conducted field-work for this paper in Tamil Nadu, the state was rated by national organizations as one of the most attractive destinations for FDI in India, ranking third out of 22 states (Venkatesan, NCAER, 1998). In some sectors the state had burst upon the national scene virtually overnight. In less than 5 years from 1995, Tamil Nadu had gone from producing no cars to being the production-base of three top ranking international automobile producers: Ford, Mitsubishi, and Hundai. Similarly, from being a state known mainly for its heavy engineering industrial base, Tamil Nadu is now the leading contender, along with Karnataka and Andhra Pradesh for Information Technology and Software Development FDI in India, and is regarded as “one of the three corners of India’s Silicon triangle” (Richard Celeste cited in Bajpai and Radjou 1999). Indeed, in 1999 Tamil Nadu became the first state in the country to develop a strategic and far-reaching Information Technology Policy which has top commitment from the state’s political leadership, and has already begun to be implemented on several fronts by the
government, within months of the policy’s announcement.

Clearly, the state government is doing something right in terms of its industrial development policies to have achieved this turnaround.³

A brief summary of Tamil Nadu’s current industrial policy agenda, as articulated by Tamil Nadu’s Finance Secretary (Mr. Rajaraman), and Industries Secretary (Mr. Srinivasan), clarifies what the state is “doing right.” The state’s industrial policy framework has five key components: (1) Strengthening existing sectors that already have a core infrastructural and productive strength in the region; (2) Boosting emerging sectors, such as IT and high technology; (3) Radically improving and expanding the physical infrastructure available to firms and households in the state, including communications, serviced land, electric power, transportation, and logistics (4) significantly upgrading the quality of human resources/human capital in the state by not only expanding R&D, skill formation, and basic literacy across the state, but qualitatively modernizing the skills that public schools provide (such as creating a new, broad-based and modernized skill base for the “new,” IT-related growth industries by including computer literacy in the curricula of all high school across the state). (5) And finally, the government has embarked on an ambitious and far-reaching program of public sector reform to bring greater efficiency and accountability to the way in which government agencies carry out the public’s business. Through these efforts, the Tamil Nadu government hopes to put in place policies that will produce a modernized and productive economy capable of marshaling the resources needed in the future to compete more successfully with its competitors in a rapidly changing international economy.

As we see in the next subsection, these efforts by the Tamil Nadu government fit well with some of the key challenges it faces as it tries to strengthen local industry in the face of rising international competition and greater deregulation at home.

**Organization of the paper and main findings**

The main analytical points of the paper and the overall discussion of the evidence are organized around 5 key themes in the rest of the paper. These themes also form the broad conclusions of the study and are listed below.

³The interesting question of what explains this turnaround is a complex and interesting research question in its own right, and is outside the scope of this paper. But in part, this turnaround is clearly a result of dynamic pragmatism on the part of the state’s political leadership and a restructured bureaucracy, driven in part by more open competition between the southern states of Karnataka, Tamil Nadu, Andhra Pradesh, and the western states of Maharashtra and Gujarat to attract investment and spur industrial growth in response to greater liberalization after 1991.
1. **Improving industrial productivity and profitability through developing new capabilities, and production practices**

To compete sustainably in the long run, Tamil Nadu’s firms will have to compete on the basis of innovation, adoption of improved production practices, and technology development, rather than just low wages. This will require restructuring how firms interact with each other, with the state, and with outside markets; and it will require adopting practices that help develop new competitive capabilities. These capabilities are: flexibility, speed, technological upgradation and innovation, organizational adaptation, an improved capacity to produce new products and processes, and an ability to successfully penetrate new markets abroad and at home. In addition to working with firms to find ways to build these capabilities, the challenge for government policy will be to improve industrial productivity, lower the costs of conducting business in the state via improved infrastructure and other services, and crucially, to increase the profitability of private investment in manufacturing.

2. **Establishing an evolving process of local learning through the development of deliberative institutions, and institutions of mediation**

Exactly how, and through what mechanisms, the changes listed above will occur, especially in ways that fit the particular context of Tamil Nadu’s industrial experience cannot be derived simply from “blue-prints,” or from a checklist of successful market-reforms in other countries. While these outside experiences serve as important guides for action and comparison, Tamil Nadu’s firms, associations, and government agencies will need to establish their own processes of learning from the ground up. One example of such a learning mechanism involves setting up *deliberative institutions* locally. These are loosely coupled arrangements of public discussion and exchange of information that allow public agencies, firms, business associations, and workers to concretely examine and jointly reflect on their own innovative experiences or the outcomes of new initiatives to learn about what strategies work, which do not and why (see Sabel 1994). A second set of institutions that are critical here, and which define a new role for government, are *institutions of conflict resolution and mediation* through which public and private interlocutors can facilitate collaboration and collective action among competing parties to meet stringent outside standards, or come to joint agreement over divisive issues—such as rules to protect intellectual property rights, compliance with international trade protocols and so forth (See Rodrik, 1999).

3. **Building a robust and adaptive human resource base that is commensurate with the demands of the new competition**

Complementary to learning about what productivity-enhancing strategies would work in Tamil Nadu, and the adoption of new production practices, is the need to develop human resource capabilities that are commensurate with the goals of improved industrial productivity and performance. This would involve building upon Tamil Nadu’s excellent base of skilled and educated workers, and strengthening its tradition of nurturing science-based technical learning. To achieve this, both firms and the public sector would have to increase their commitment to
investing more in training, skill-upgradation, and broad-based human resource development. Crucial also is the development of closer, and more collaborative ties between private firms, R&D institutions, university-based research initiatives that are relevant for local industry, and renewed public sector support for research and development of innovative products and processes.

4. Creating institutions of broad-based upward mobility to cope with the dislocation of restructuring and bridge the new inequalities that the process will inevitably produce

Successful industrial development is ultimately also a process of redistribution. A crucial caveat in this regard is that the process of restructuring described above—involving upgrading of production practices, enhanced export performance, and new knowledge—will undoubtedly create severe dislocations and new inequalities in terms of a mismatch between existing skills, resources, returns, and investment. In order for industrial growth to remain dynamic and sustainable in a fiercely competitive environment, it is important to craft policies that do not exacerbate the inequalities and disequilibria that the restructuring will inevitably produce, but which try to bridge them by widening the access of those at the bottom to new skills, resources, and opportunities that are needed to be productive in the new economy. In other words, it is important not to base the state’s future industrial prosperity on the fortunes of just a few sectors, or a few city-regions, but to adopt policies and create institutions that allow for broad-based upward mobility over time. Even if there will likely continue to be disadvantaged sectors, and low skilled jobs, it is crucial to ensure that the same people do not remain stuck at the bottom permanently; and even if they start at the bottom, that they have options and social opportunities to move up, eventually.

Policies conducive to this upward mobility involve strategies that would maximize spill-overs across sectors and space, including the provision of collective goods, the creation of an environment that supports entrepreneurship and risk-taking, the widespread diffusion of new technologies, skills, and knowledge across the state, the use of information technologies to create not just a few high-growth, high-technology enclaves, but several linked networks of production, involving not only large and medium firms, but also dynamic small producers. The key link between social opportunities for upward mobility offered by computer literacy in the new economy, which the Tamil Nadu government has presciently grasped through its high-school computer literacy drive, is an example of how the new, rising technologies need not be exclusionary, but can be encompassing if handled creatively.

5. Inducing new dynamism within the public sector through innovative administrative reforms

As the Tamil Nadu government has already started to do, it is crucial for the government to restructure the way it conducts the business of industrial development if this period of policy transitions is to be successful.

Each of these five themes is developed in the five sections that follow.
SECTION 1: Policy Transitions in Production

I. Improving adaptiveness, productivity, and profitability: A Revised Agenda of Industrial Promotion:

The evidence from countries that have opened up to greater competition over the last two decades shows that manufacturing (in contrast to services, natural resource based sectors, and processed agriculture) has usually faced a secular decline in many countries after liberalization. Chile, Argentina, Mexico, and even Hong Kong after China opened up, are examples of this trend. In each case manufacturing output (domestic and exports) declined significantly, even as the overall economy grew, led by agricultural exports. But manufacturing employs large numbers of people in many countries, especially in traditional sectors, as it does Tamil Nadu; and a viable manufacturing sector is at the heart of a strong industrial economy.

The first point, then is that in order to compete successfully--and sustainably--in an open economic environment, it is critical that Tamil Nadu maintain a viable, diversified and locally rooted manufacturing base, focusing not only on attracting firms in the emerging high-technology, high value added sectors, but paying attention to the modernization of its labor-intensive, traditional sectors, and deepening the capabilities of sectors in which Tamil Nadu is already strong.

In this section I want to make two sets of points: First, to improve domestic production capacities, Tamil Nadu needs to maintain and further develop a locally-rooted diversified industrial base that has four characteristics: (1) An industrial base that builds upon Tamil Nadu’s historical advantages, such as its engineering base and technically skilled workforce, while also nurturing new sectors; (2) A capacity to absorb outside investments by multinationals seeking access to India’s domestic market, as well as those looking for a cheaper export platform, while not driving down domestic investments in key sectors, or becoming hostage to enclave development by footloose multinational investors attracted to Tamil Nadu by primarily cost concerns. (3) Development of the domestic market even while exports are expanded. And (4) The creation of a strong middle tier of intermediary firms as a way to anchor outside investments locally, and diffuse industrial growth more broadly.

Second, as Tamil Nadu’s government has already realized, using fiscal incentives to attract FDI has a worrisome side effect of fueling a race to the bottom; One way in which the Tamil Nadu government is countering this trend is by focusing on: (1) dramatically improving the quality of infrastructure in the state; (2) creating a new image of the state as an investor friendly, reliable, and effective partner of industry, and (3) paying attention to ensuring that new growth occurs in a way that doesn’t widen intra-state disparities in access to jobs and economic opportunity. (Interviews, 1999). I would add to these two more, linked points. (3) The need to create, and deepen, a new class of production infrastructure that can be called “manufacturing services.” This would include pushing the state’s image of transparency, and instituting rule-
based protections for intellectual property rights in key sectors, as well as the upholding of international agreements. And (4) Investing broadly in creating livable cities and regions.

A three-pronged strategy that might help achieve this goal of developing a locally rooted, diversified industrial base in Tamil Nadu would thus involve:

(a) Shaping the competitiveness of the emerging, high growth, high technology industries at the state’s cutting-edge (e.g., Information Technology, Telecommunication services, high-technology engineering, automobile assembly, high value-added, service-enhanced goods, and processed agricultural exports) through a variety of efforts: These would include (i) technology development, (ii) installation of reliable and relevant infrastructure, (iii) R&D investments and more industry-relevant research at local universities, (iv) creation of regional “centers of excellence” throughout the state, and (v) the development of a human resource base appropriate to the needs of these high technology sectors.

(b) Encouraging and nurturing the development of a strong and productive middle tier of firms in [mid-tech] sectors where the scope of harnessing linkages (backward and forward) is strong; and where there are opportunities for the rapid diffusion of technology and knowledge across firms and between sectors. Examples of such firms would be intermediate goods producers, and supplier firms who provide specialized services, or products to assemblers or final goods manufacturers in several sectors. The main point here is the need to generate a dynamic mechanism that will tie the growing sectors of the economy to the rest of the economy in a way that enhances the diffusion of technology, know-how, and demand across sectors through linkage effects. This means paying particular attention to middle-sized, mid-tech intermediate-goods industries that are tied into multiple sectors (see Tendler, forthcoming for evidence on this from Brazil).

(c) Modernizing and restructuring the labor-intensive traditional sectors such as textiles, garments, leather and footwear through the introduction of new manufacturing, design, and innovative marketing practices. Transforming the low-end traditional sectors and making them more productive is critical for the long-term viability of the region’s industrial sector.

Next, we examine examples from countries that are Tamil Nadu’s competitors and see how they have modernized their existing industrial base.

**Industrial modernization:**

In order to cope with the competitive pressures that Tamil Nadu’s firms will face over the next 4 years, it is important to understand how firms in other countries with whom they will be competing have been changing. In the case of textiles, for example, domestic firms in India and Tamil Nadu are likely to face increased competition, starting as early as 2002/3. This competition is likely to come from low cost countries like China, from advanced economies like Italy and Germany, and from countries like Turkey, Taiwan, Hong Kong, that have upgraded their production technologies in the last half decade, and will continue to do so.
For example, in the textile sector: Turkey has aggressively upgraded its old technical base in textiles by widely adopting the efficient open-end rotor technologies in recent years. Firms in Italy and other advanced economies have increased their productivity dramatically as a result of new production practices and a variety of process innovations—and not just new capital investments. This includes the widespread adoption by firms in these countries of new management practices such as Total Quality Management and Just-in-Time inventory systems, improved data gathering, evaluation and reporting systems, and improvements in product design abilities. Some of these European firms have drastically reduced manufacturing and delivery times in the past years, in some cases by as much as 200%. In order to do so, several countries have developed targeted programs to enhance productivity, such as Canada’s Program to Enhance Productivity (PEP) in textiles. Finally, Tamil Nadu’s firms will have to meet stringent new environmental demands from overseas buyers (such as Germany, Japan, and the US) that will affect in-process as well as end-product production requirements. (Examples drawn from Chandra 1999).

To understand what policies have led to the successful modernization of traditional sectors in these countries, we turn next to a detailed examination of specific instances of policy reform in countries like China, Brazil, and Chile in the wake of liberalization. We examine the policies they adopted to help modernize their key existing sectors such as textiles, garments, and agro-processing.

**Elements of successful modernization: the case of textiles, garments, and agro-exports**

In Indian industrial policy, “modernization” is most typically associated with technological upgradation and training. As the examples below show, successful modernization of traditional sectors usually involves much more than the infusion of new technologies in targeted sectors. For example, the impressive growth and modernization of China’s textile and apparel sector over the past fifteen years has involved a complex combination of at least four factors in addition to the strategic infusion of new technology in the sector. These include: (i) policy initiatives that have sought to develop capacity at both the high-value added as well as the mass-produced, standardized ends of the textile industry; (ii) significant investments in training by the government and firms, (iii) organizational changes within firms that enhanced productivity, and (iv) concerted efforts at market penetration.

When the Chinese government began to promote the textiles industry in 1978 as a key growth sector and a crucial source of foreign exchange for investment in other sectors of the economy, it made two decisions. The first was to thoroughly modernize the textiles sector technologically; and the second was to link this infusion of new technology (and other initiatives) to a particular, strategic goal—of building market share. This goal of building up market share shaped the nature of the government’s modernization program.
Chinese firms have invested over $1 billion annually in the import of new cotton and silk processing equipment since 1985. The state run Beijing Cotton Mill alone has invested close to $1 billion in new equipment over the past ten years. These investments have gone into new machinery (such as rotor machines, and shuttle-less looms in spinning mills), as well as into new and innovative production systems such as statistical process control capabilities and machines that detect in-process defects. Between 1987 and 1996, for example, China invested in 68,000 modern shuttle-less looms while Indian firms invested only 8000 such looms in the same period (Chandra 1999) [foot note: indeed over 50% of the world’s 3.6 million outdated shuttle looms are in India]. Similarly, with the use of better equipment, and key organizational changes, China’s defect rates are half those of Indian textile firms (3-5% in India, compared to 1-3% in China, and 0.01-1% in advanced industrial countries like Canada.)

But the government did not see the technological upgradation of the textile industry as a goal in itself, rather it was a means for increasing China’s market share at both, the low-cost, high volume and the high value-added, low-volume ends of the global market. Exports were key to this two-pronged strategy, as was the central role played by Chinese expatriates from Hong Kong, Taiwan, Europe, and the US as “market-makers” and investors in new factories within China, as well as key links to new markets abroad (Chandra 1999).

In this regard, Chinese firms and the government have also made significant organizational changes in the textile industry. First, China has improved the quality of the textile sector’s supply chain management by revamping input supply and raw-material quality at one end, and investing heavily in improving the quality of finishing and dyeing processes at the other end. At least in the export sector, the Chinese government has also invested in developing new and improved yarn varieties, and helped firms adopt improved measurement and control systems that operate throughout the production chain, and limit wastage by helping detect defects. This is just the area where the Indian industry is weakest. Several analysts have found that the absence of good quality finishing and dyeing, and poor quality or defective yarn, are key factors that limit the entry of Indian textile firms into higher-end markets (Belliti 1998, Chandra 1999).

Organizational change has also occurred at the inter-firm level in the Chinese textile industry. For example, Chinese exporters have reorganized production to improve delivery times, speed up the flow of information and products between producers and suppliers, and hence cut down on the need for in-process and input inventories. In 1998, according to one study, only 11% of textile firms in China held 75 days worth of raw-material inventories, compared to over 36% of Indian firms that did so.)

The lesson about technological upgradation and organizational change:

The Chinese government’s efforts to combine technological change with organizational change and to not view technical upgradation as an end in itself, but as a means to market growth, illustrates a crucial, larger point: there are limits to relying exclusively on
technological upgradation as a means of improving firm-competitiveness. The most striking finding that emerges from looking at cases of successful adjustment in several countries is that although technological change has been important in most cases (for example, involving new equipment, better plant infrastructure, improved transport, handling, storage, logistics, and process control mechanisms), the most impressive productivity gains have come from process improvements, and adopting new organizational practices, rather than from new capital investments. Mere technology upgradation is not enough to increase productivity; the most successful firms pursue both technological upgradation and extensive organizational change at the same time.

Indian firms, by contrast, have often nurtured a kind of technology fetish, where access to the state of the art technology and equipment is often considered by firms as well as government to be a pre-requisite for improved performance. A recent study of machinery-use by engineering firms in five countries--India, China, Thailand, Korea, and the US--sponsored by Germany’s Machine Tools Association found exactly this attitude toward technological upgradation in India. Most of the Indian managers interviewed for the study identified lack of state of the art technology as the primary cause of low productivity in their plants. Chinese firms, by contrast, were interested only in that level of technological upgradation that would help them secure wider access to markets abroad. They emphasized market access as the primary goal of production reform, and viewed new machinery and equipment in that light: as only one of many elements in a strategy that would help them increase their market share at both the high and low ends. (Meil, ISF, 1998).

Similarly, in a study I conducted of woolen knitwear firms in Ludhiana, I found that the firms that had been most successful in entering western markets after the collapse of the Soviet Union (India’s primary export market till 1991), had all implemented deep organizational changes in their production processes before they invested in new equipment and new technology (Tewari 1999). This is not to say that investments in new and modern technology are not important; they are, especially in India where firms in traditional sectors continue to operate with obsolete and outdated technology, and where, in many cases even new investments still go toward the purchase of old technologies. [For example, a lot of the new investment in the Indian spinning industry over the past five years has gone toward the purchase of old technology such as shuttle looms, rather than the more up-to-date shuttle-less looms which most of India’s competitors (China and Turkey) current use]. The caveats I want to raise, rather, are threefold. (1) The need to guard against viewing state-of-the-art technology as the first best answer to fixing productivity problems. Some times it may be the answer, sometimes it may not be, depending upon what the broader goal is. (2) The need to be strategic

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4 In another study, Mody et. al. (1992) also found that new equipment is most effective in increasing productivity when it is combined with or accompanied by organizational change, such as reduced wastage, better product quality and design, increased product variety and just-in-time inventory management practices.
while investing in new technology. In the Indian knitwear industry, for example, many outside analysts believe that the marginal benefit of investing in finishing (washing, dyeing etc) technologies is likely to be much greater at the present time (in terms of increased productivity and market share) than investing in other kinds of equipment. (3) And, finally, the crucial importance of not over-looking the key role of non-equipment based organizational changes in improving productivity and firm performance.

On this last point, there is evidence from a set of studies of Brazilian industrial restructuring that in sectors, or products, where raw material costs form a high proportion of total production costs, improvements in, and lowering of, non-labor related indirect expenses is much more significant in terms of improving productivity and performance than the effects of lowering direct labor costs, or trying to raise productivity through equipment-related investments (Tendler, forthcoming, Dohnert 1998).

**Ensuring reliable, high-quality input supply, supply chain development, and improving coordination across the production chain:**

A key feature of successful adjustment, especially by firms that have managed to improve their productivity and enter outside markets (especially in countries like China, Chile, and Brazil that have many of the same bottlenecks that Indian firms face) is timely access to good quality raw materials and inputs at reasonable cost.

In its reform of the Chinese Textiles industry, for example, the Chinese government did two things to rationalize and strengthen the textiles production chain where it was weakest. First, it removed uncertainty around the access that firms had to raw materials by establishing new procurement arrangements. For example, the government set up institutions to channel raw materials and finished goods through regional pools. This pooled arrangement not only removed the uncertainty that firms had experienced around the availability of good quality domestic and imported raw materials. But in taking advantages of the scale economies that regional pooling offered, the government also lowered the cost to firms of imports and marketing. Second, the government improved the coordination across the production chain by making a single authority responsible for all permits, sales, and export formalities. A single apex body for each sub-sector handles all export formalities and coordinates across all the related sub-sectors in the production chain. The Tamil Nadu government’s creation of GUIDANCE, as the single-window site to help firms start new enterprises or enter new markets is a similar, if a somewhat distinct, effort. GUIDANCE serves an important function by centralizing in one place a host of administrative requirements that firms have to comply with; unlike the Chinese case, it is not organized strategically around each specific production chain. A different set of institutions might be needed to fulfill that sort of function—perhaps under, or even outside GUIDANCE.

A related collaborative function between firms, workers and government agencies is the provision of adequate and modernized training to industrial workers and firm managers. The Chinese government has focused heavily on providing strong support for technical training
as well as educational programs related to the textiles industry. Chinese firms, in turn, have also invested heavily in training their workforce in modern technology and management skills. For example, a Chinese firm, on average, provides about 70 hours of training per year to its workers and managers compared to 10 hours in India. (Chandra et al 1998).

**Discipline, reciprocity, and support: eliciting improved performance in return for government assistance**

One of the enduring critiques of how the Indian government has historically handled industrial promotion is that most of the government’s incentives and subsidies have been giveaways. The government never did, and was unable to, institute measures to demand improved performance in return for government assistance. As Amsden (1989) has pointed out in her work on South Korea, one of the key mechanisms that prevented the Korean government’s interventionist support of industry from degenerating into corrupt rent-seeking was the government’s reliance upon the principle of *reciprocity*. All government support to industry had sunset measures, and the continuation of support was predicated on assurances, and evidence, of improved performance—in terms of meeting export levels, or increasing productivity—by recipients firms. China’s ongoing experience in several sectors reflects the same principle, and it would be critical for Tamil Nadu to look closely at instituting a similar performance standard for industry in the state.

In China’s turnaround of its Textiles industry, for instance, we find that in return for its support, the Chinese government has demanded improved output and productivity from firms (especially export firms) and has instituted *built-in disciplinary mechanisms to enhance compliance and firm performance*. For example, for all PSU’s wage increases—indeed wage bills—are tied to output levels, and benefits are linked to productivity increases. Managers of PSU are part of a “responsibility” system where they retain a share of their export revenues beyond a threshold of performance (Walder 1995). Because each PSU must furnish its own foreign exchange to buy new equipment or carry out other restructuring, this incentive of retaining a part of their export earnings has driven many firms to export. Exports, clearly, are a key way for firms to earn revenues to purchase new technology and pay for process-oriented changes that help firms improve productivity, which in turn helps them win other support from the government. The government has also encouraged a “market” for innovation; and innovators periodically get together and sell their innovations to firms (Chandra 1998).

Another form of reciprocity is in getting larger, better performing firms to mentor smaller firms. The economic success of Chile’s processed agricultural exports sector is an example of this mentoring relationship. Till the late 1970s large firms had poached on each other’s small suppliers to get the best (lowest) rates. In the 1980s, the government helped radically transform this relationship by helping organize large customer firms and their small supplier firms into production networks. These changed production ties also involved assistance by the government to develop new capabilities within the large anchor firms, and establish new
institutional arrangements that gave them incentives to upgrade their small suppliers in ways that enhanced their collective capacity and improved overall performance. Thus, the Chilean government helped reshape buyer-supplier relationships to ensure that producers had access to high quality inputs; and this was a crucial step in the ability of firms to meet demanding new international standards in lucrative markets abroad.

**Diversification of product mix**

The successful modernization of hitherto protected sectors also involves a *diversification of product mix*; and this in turn involves entering into new and demanding markets. For example, a recent study of India’s machine tool and textile industries found that Indian firms in both these sectors did very poorly in terms of growth compared to Chinese and other firms because they remained risk-averse and chose not to diversify into more demanding markets after liberalization in 1991. “Indian industry was unable to capitalize on the opportunities of opening up because they stuck to low ends of their markets, and any ‘forced’ modernization and upgradation of quality and production management did not occur” (Uchikawa 1999).

Clearly, as noted earlier, it is not easy for firms to suddenly become players in demanding external markets after years of being sheltered behind high tariff walls and protectionist policies. The process is unfamiliar, risky, and highly competitive. How can public policy facilitate this process of adjustment to outside markets? Two examples below show what the state can do to help firms find out about outside production standards, and work with them to find ways to meet them. One example comes from the successful turnaround of the garments sector in Ceara, Brazil; and the other from the spectacular export success of the processed-agricultural export industry in Chile. Both examples illustrate two important points. The Ceara case makes a crucial point about the power of building an image that, if successful, can boost the growth of a whole sector. The Chile example shows how changed relationships between large customers and small producers operating in clusters and production networks can create conditions of tutelage and training for smaller producers.

**Upgradation and successful export performance: large anchor firms as mentors of smaller suppliers in Chile’s processed agricultural export sector**

Chile today is a key global player in the export of processed agricultural goods (such as tomato paste). Between 1981 and 1995, Chile experienced a 50-fold increase in its output of processed tomato paste, and went from only $2 million in exports to $200 million by 1995. This impressive export success is usually attributed in the literature to Chile’s adoption of market reforms under Pinochet’s regime from the late 1970s onward. Recent analyses go beyond this story and show how, much more than deregulation and undistorted price signals was needed to get Chile’s processed agricultural producers to export successfully (see Perez-Aleman 2000). In the 1970s, just before the reforms began, Chile’s tomato paste producers faced many of the
same problems that some of Tamil Nadu’s traditional industries currently face. For example, (1) Production capacity was highly fragmented because most plants were small in scale; (2) plants used mostly reconditioned second-hand equipment that was severely outdated compared to the plant quality of Chile’s key competitors (California, Italy and Portugal). (3) They used poor quality raw materials purchased on the spot market. Most of the local fruit varieties that they used were inappropriate for industrial processing. (4) The volumes produced by these firms were not sufficient to achieve a relevant presence in foreign markets. And finally, (5) none of the firms could meet the quality standards required for export to overseas markets.5

The transformation of Chile’s processed foods industry from a low-quality producer to being a world-class exporter that it is today involved active initiative on the part of the government, before and after the adoption of market reforms, to help industry improve its technological capacity and facilitate the reorganization of inter-firm relations within the sector.

Prior to the onset of liberalization in the late 1970s, the government did several things to modernize the local agroindustry and make it more competitive. First, the state’s production development agency (CORFO) conducted a thorough review of existing Chilean business practices in comparison with prevailing international best practice in order to identify what needed to be changed. It searched out, and documented best foreign practices to serve as a model for how to bring about changes, and on the basis on this knowledge, engaged in a series of development projects that sought to transfer know-how to local firms of plant varieties, cultivation practices and industrial processing technologies.

Second, CORFO helped firms restructure their previous spot-market procurement system. In the new model, CORFO promoted the creation of a “leader” processing firm that would assist in, and be responsible for, the diffusion of improved production practices to its suppliers. This model was based on Chile successful reform of its sugar beet processing industry in previous years. A key innovation in the sugar case had involved closely connecting the technical personnel from the larger processing firm to its smaller, external suppliers in order to upgrade the capability of the small suppliers.

After market reforms were adopted, these efforts were strengthened by four new features: (a) price stability; (b) introduction of quality control to monitor every step of the production process; (c) the provision of a new package of services; and (d) deepening the development of production networks with strong tutelage ties between technical personnel of the large firms in the network with their small suppliers. Weekly visits by the plant’s technical personnel to their supplier firms made learning, information exchange, and focused technical assistance an ongoing and interactive process—not just a transfer of technical know-how.

5 The Chile case discussed here is drawn from Perez-Alemanís (World Development, 2000) account of Chile’s successful adjustment to trade liberalization.
Using market pressure and incentives as a lever to reform cooperative institutions: The case of the Handloom industry in Tamil Nadu

Interestingly, Tamil Nadu’s Handloom department has initiated a similar process of innovatively linking restructuring in Tamil Nadu’s troubled Handloom sector, to market demand. Historically, Handloom weavers who were part of the government’s cooperatives were bound by protocol to purchase raw material (yarn) from spinners who were also part of these cooperatives. This locked the weavers into a poor raw-material base. Lackluster research and development and extension in cotton, and the certainty of a captive market were some of the factors that have so far kept yarn quality in Tamil Nadu’s Handloom cooperatives abysmally low, and the Handloom sector stagnant. Disbanding the cooperatives is a politically charged, difficult task, which has only recently begun to be addressed by the government—and even at that, mostly passively, via attempts to downsize the cooperative sector through voluntary retirement schemes. Despite the complex politics of state-sponsored handloom production in Tamil Nadu, the Handlooms Directorate seems to have found the key to change: it is using market demand as a lever to transform inter-firm relations within the sector. The Directorate (led by Davidar) conducted an evaluation of market demand, and found that there was sufficient demand for Handloom products, provided product quality, product variety, and product design, and crucially, yarn quality could be improved. This knowledge has allowed the Directorate to de-link the automatic connection between cooperative-based yarn suppliers and weavers in Tamil Nadu. Without attempting to revamp the sector as a whole, the Directorate has wisely focused on that part of the production chain—weaving and product design—for which there is market demand, and where the supply chain can be reorganized by using this market pressure. Weavers in the Handloom cooperatives are now free to procure yarn from the open market. The results—although it is still too early to tell—appear to have revived and brought to life the Handloom weaving industry, even while spinning remain troubled. Linking Handloom weavers more closely with buyers may also lead to improved feedback about product quality and design that can further improve the quality of the sector’s output, and help it move into new markets.

This experience also illustrates the importance of sequencing in reform (Hirschman 1958, 1967). Taking on those changes that can show quick results is likely to build credibility for the government’s efforts in the eyes of the industry as well as buyers, making it easier to tackle the more difficult changes against this background of initial support. Indeed, for its part now, the Textiles secretariat has established a committee under the state’s Agricultural secretary to examine ways to improve cotton quality and output, and hence improve the backward linkages in the spinning segment of the Handloom industry.

The Power of Image: Building a positive image to boost a sector—the case of successful restructuring in Ceara’s garment industry in Northeast Brazil

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6 This example is drawn from Sylvia Dohnertís study of the Brazilian Northeastís garment industry (Department of Urban Studies and Planning, Typescript, 1998)
Like many other lagging regions, till the early 1980s, Ceara’s garment industry suffered from an image of poor quality and a reputation of being a low-end producer of cheap products compared to Brazil’s premier garment pole in the South. In response to low revenues, low capacity utilization and eroding employment, the government of the state of Ceara launched an extensive campaign to boost the reputation of Ceara as a major garment producer and improve the quality of its products. First, to increase capacity utilization, the government encouraged large local firms to enter into export markets. And second, the firms, themselves, turned toward the large Brazilian domestic market. The export strategy suffered in the early years due to the inability of local firms to meet outside production standards. This led the government to focus on “building the base” and stimulating local activity to strengthen the quality of local output by making improvements across the production chain. First, just like in the Chile case discussed above, the government encouraged firms to form production networks and assisted these groups (not individual firms) in a variety of ways to improve their output. In particular, the government focused on providing key inputs that the private sector has difficulties providing. For example, the government invested in (a) extensive training (via training subsidies to large firms who had built a network of suppliers around them), and once again focused these efforts on the group and this succeeded in diffusing the new skills to smaller suppliers via their large customer firms. (b) The government used incentives to attract input suppliers to the region. This helped improve backward linkages in the sector, which in turn lowered input costs, lowered uncertainty and reduced turn-around time significantly. (c) The government invested heavily in providing public goods such as basic infrastructure: roads, warehouses. (d) The government thought spatially when targeting its programs in order to maximize spillovers.

Second, with all of these efforts as background, the government moved aggressively to improve Ceara’s image as a garment producer. Widespread publicity, brand-name imaging, and marketing assistance were key to this approach. However, rather than fund individual large firms to promote their own brands through the media, the Secretary of Industry and Commerce worked with garment producers to create an image for the state as whole to be identified as a successful garment producer. The government scheduled two annual garment fairs in Ceara and advertised them nationally as being part of the Brazilian circuit of important garment fairs. The Secretary of Industry initially even funded the visits of the important southern garment producers to participate in Ceara’s fairs. Similarly, large firms form Ceara began to attend Brazil’s most important textile fairs as representatives of Ceara, rather than as individual firms promoting their own items. This blitz of effort was capped by the location of a few large garment producers in Ceara, which further improved the image of the state as an important site for garment production. By the mid-1980s, Ceara had completely revised its earlier negative image associated with low quality, and was regarded nationwide as the “second largest garment pole in the country,” even when in terms of strict numbers, there were others who had bigger market shares at various times. But this strong positive image has attracted huge amounts of investment by outside firms—final goods and intermediary goods producers—and today the textile sector is a vital area of growth in the state’s economy, with its own growth dynamic.
In the next two sections I expand on some of these points. In particular, the issue of targeting public policy toward providing inputs that the private sector cannot provide by itself, the importance of sequencing, and the crucial need to design industrial policies in ways that maximize spillovers, and diffuse benefits widely across space.

But first, a brief word about the flexibility and adaptiveness that are the hallmarks of successful industrial adjustment today.

**Speed, flexibility, and product variety:** A defining characteristic of firms that have adopted high quality production systems is adaptiveness and “flexibility.” Much has been written about “flexibility” and responsiveness in the recent management literature, and some of the many dimensions of the term include: an ability to respond rapidly to uncertainty in product markets, an ability to work on many different products at the same time, to get products to market quickly, to detect defects and respond to them rapidly, to detect customer preferences and respond to them, to produce products for diverse market segments, and different kinds of customers, and to be able to switch rapidly from one product to another in the face of demand fluctuations (Berger and Lester 1997, Sabel 1994, Schmitz 1995b).

Firms that have adopted high quality production systems, and have learned to be responsive, are usually, but not exclusively, associated with exports and exposure to outside markets. Three of the most typical mechanisms by which firms have acquired flexibility include:

1. **Joint ventures** with foreign companies, particularly companies from high quality markets. Domestic firms learn how to meet international production standards through the transfer of knowledge, production practices and organizational know-how from their partners through collaboration in production and joint responsibility for a good, service, or sub-assembly.

2. As we have seen in the Chilean, and Brazilian cases above, in several cases, the learning comes from a *relationship of tutelage between suppliers and large customer firms, or buyers*. In some cases the large customer firms may be domestic manufacturers and/or assemblers to whom small firms supply. In other cases the large buyers may be retailers at the head of powerful international commodity chains. For example in Mexico several apparel firms, furniture producers, and electronics producers have entered into direct ties with large buyers from the US market (Wal-Mart, Home Depot and so forth). The key characteristic of such ties is the establishment of a feedback giving mechanism between the buyer and their developing country supplier. These relationships are tight and restricted to a small group of first-tier suppliers. As several scholars have pointed out, these learning ties seldom reach far enough back in the economy to benefit others who are not directly part of such relationships. They can also drive developing country suppliers to uncomfortable degrees of dependence on developed country based, footloose commodity-chains if suppliers are not careful to diversify their customer base over time (Dussel, Piore et. al. 1996; Harris-Pascal et. al. 1999).

3. Sometimes intermediaries such as *buying agents* may play this tutelage role---as for example in the Brazilian shoe industry where US-based buying agents helped Brazilian footwear firms win large orders from key US retailers (Nine West, Marshals, Walmart and so on). These
buying agents sought to build exclusive relationships between certain US buyers and certain networks of Brazilian suppliers. This allowed them to transfer product design information, technical know-how and specific process requirements that specific retail chains wanted in their products. Within a relatively short period of time Brazil became the second largest supplier of footwear to the US (after China) as a result of this tutelage and market-making role of US-based buying agents. (Schmitz 1995a).

SECTION II: Infrastructure, Image, and Manufacturing Services

Much has been written about the critical importance of providing good, reliable, and broad-based infrastructure to both, attract new foreign and domestic investment, and to make existing and new investment more profitable by lowering the infrastructure costs that firms face in the region where they do business. (See the various studies conducted by HIID on this issue for the Tamil Nadu context). Good transportation networks (roads, ports, airports), logistics infrastructure (warehouses, storage, freight transportation), uninterrupted and affordable electric power are repeatedly found by analysts to be associated with increased FDI, increased domestic investment and better industrial performance (World Bank 1994, Wheeler and Mody 1992).

I will not repeat the familiar arguments about the importance of good infrastructure to industrial competitiveness in this brief note, but suffice it to say that physical and communications infrastructure remains a critical bottleneck in Tamil Nadu, and the government of Tamil Nadu has identified it as such. The government has drafted specific plans to address the problem. Some of these ideas are especially good and pragmatic. For example, the government has wisely prioritized its infrastructure thrust areas. Its four areas of emphasis are: (1) creating a land bank so that individual firms looking to invest in the state do not have to waste time tracking down land, getting all the relevant permits and then developing it for industrial use. The government is in the process of acquiring 40,000 acres of land across the state for development as industrial parks. It would also be useful to let private investors—domestic and multinational—to also invest in developing industrial parks. (2) Extending the network of roads, ports, in the state, adding two new airports, and most importantly, paying special attention to the development of the logistics sector with the development of warehouses, storage godowns, and modernized, refrigerated transport facilities across the state. This is an important investment, because several studies in countries like the US and Germany have found that logistics is key to the smooth and efficient operation of supply chains. (3) Opening up the power sector to outside investment, including captive power-supply through self-generation and co-generation, as well as an effort to attract alternative sources of power to the state, such as the ongoing L&G gas pipeline project and a lignite power project (Interview, Mr Praveen Kumar, Mr. Rajaraman, Mr, Srinivasan, 1999). (4) Finally, the government is committed to boosting the state’s communications infrastructure by focusing on creating a few world-class sites that can support state of the art telecommunications infrastructure to support ambitious IT-related projects. As the government’s IT secretary
noted, “Effective Information Technology operations require that the government be able to
guarantee the availability of services like telephones, gateway planning, earth stations and all sort
of other telecommunications needs of IT firms. But the government of Tamil Nadu cannot hope
to come anywhere close to the resources and quality of services available in advanced industrial
countries in these areas. Therefore the government has decided to focus on creating *Centers of
Excellence*, where you can guarantee that these services are state of the art. Once you enter
these parks [e.g., the TIDEL park] it won’t matter whether you are in Chennai or in New York.
These parks won’t solve the problem of general standard of living; general infrastructure [city-
wide and state-wide] but these parks are an important start. Because this sector is important
for the state in terms of income growth, general industrial growth, and employment generation,
the state will push it.” (Interview, D. Prakash 1999). This is a crucial point. Strategic, and
sequential investments in a few well-located sites around the state, if successfully undertaken,
are likely to encourage private investors to help broaden these services in partnership with the
state later on.

With regard to the government’s proposed high Technology TIDEL park, an
additional point that needs to be made relates to the importance of distinguishing between the
needs of large IT firms and the different needs of small, emergent, start-up high technology
firms. Potential start-up small firms may be more widely distributed across the state, but it is
precisely these smaller firms that need more intensive contact with and feedback from their
customers, buyers and users. Yet, it is just these firms that cannot afford the high costs of
access to, or location in expensive down-town sites in the heart of large cities like Chennai. The
government will therefore need to pay special attention to creating a series of networked hubs
that can support the needs to smaller start up firms in a more decentralized, yet regionally
clustered and electronically interconnected fashion. (Berger and Lester 1997 make similar
suggestions about creating “‘virtual’ science parks for start-up, early-stage, and small
technology based enterprises.” (pp. xvi).

**Livable Cities and Regions:** Another important, but often overlooked aspect of
infrastructure is the viable development of urban space, and livable regions. As the experience
of several rapidly growing cities and regions demonstrates, successful growth can become self-
limiting if urban services and the infrastructure of city regions (housing, water, sanitation,
reasonably priced real estate) become overburdened by the demands of growth. The case of
Bangalore, as well as the more well known case of Silicon valley in the U.S. shows that
extraordinarily high real estate costs, and inadequate public services (water and sanitation) are
becoming an impediment to further growth in both these areas. Businesses have chosen to
locate in other states (Andhra Pradesh and even Tamil Nadu) instead of Bangalore; and
similarly many new businesses are fleeing exhorbitant real-estate prices (and congestion) in
Silicon Valley to locate in the rapidly growing high-technology locations around Austin, Texas.
Even in countries like Taiwan researchers have documented the suburbanization as well as

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7 Specific details of the Tamil Nadu case, including its public sector reforms, are the subject of a
separate paper.
decentralization of industry driven in part by escalating real-estate prices, and very congested urban infrastructure conditions (Amsden, 1990).

A key challenge for the Tamil Nadu government will be the development of viable industrial spaces, as growth picks up. The government’s ability to leverage the market, and build public-private partnerships to provide the necessary social infrastructure—e.g., affordable housing for workers, adequate water, power and transportation services, health-care and educational facilities—in and around Tamil Nadu’s major industrial centers will have a crucial impact on the image of the state, and the nature and effectiveness of the industrial investments it attracts. As one official noted, even today expatriate and multinational executives ask about the quality of Tamil Nadu’s health care facilities, and whether it has international schools, and related infrastructure as they make their location decisions (Interview, Mr. D. Prakash, 1999).

**Deepening manufacturing services:**

Physical and communications infrastructure, as mentioned above, is important. But the bigger point that I want to make here is that, one needs a novel way to think about infrastructure provision so as to form a new constituency, and new alliances that will join the effort of upgrading Tamil Nadu’s infrastructure. One way to think about these collective services that the state needs to provide, is to think in terms of manufacturing services. These include both, the old class of infrastructure services (roads, ports, highways, water, electric power, and so on), as well as a new class of production services such as assistance with finishing, packaging, information on standards, information on demand trends and prices; access to raw-materials, communications systems, and institutions to uphold key rules, agreements, contracts, and production standards.

A key hallmark of these production services is that they blur the distinction between services and manufacturing in important ways. As Berger and Lester (1997) note in their recommendations for Hong Kong’s restructuring, “the high value added goods of the twenty-first century will be service-enhanced products…[which bundle together in desirable combinations the capabilities of advanced manufacturing systems, and new possibilities in design, customization, rapid delivery, quality, and product novelty and uniqueness—all enabled by information technologies.” As consumers in developed and emerging markets demand assurances of product “quality, purity, reliability, and brand reputation,” there is a need for regions to cultivate institutions that will allow private companies and industries to meet these production standards. But in addition, they make demands on the capacities of “public

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8 This term was first introduced by Berger and Lester in their 1997 study of Hong Kong’s economy, *Made by Hong Kong*, Oxford University Press.

9 Berger and Lester make distinctions between three kinds of institutions—or companies—that generally provide these producer services: “(1) firms whose services are used exclusively to enhance manufactured products (such as trading firms, design and product development houses, freight forwarders, and environmental testing laboratories); (2) firms whose services are
institutions to set and enforce standards, to repress intellectual property and brand-name violations, and to provide a ësafe harborí which attracts innovators and investors.” (Berger and Lester 1997: xiv). As we will see in section five below, the reform of Tamil Nadu’s public institutions is also a reform by which it will be better able to provide and strengthen what Berger and Lester have called the institutions of “safe harbor.”

SECTION 3
Dealing with Dislocation: Creating Conditions for Broad-based Upward Mobility

As pressure mounts on firms to produce better quality goods, in ever-increasing product varieties at reasonable prices, and to constantly search out better and newer markets, there are bound to be severe dislocations at the industry, sector and regional level. The burden of restructuring is likely to fall most heavily on the most vulnerable workers, firms, workers and industries who lack the adequate skills, resources and opportunities to cope with rapidity of change required. The costs of allowing these dislocations to widen existing inequalities are unacceptably high, and will require far more resources to fix down the road in the future. A key theme of the state’s industrial policy should be attempts to do things in ways that widen access, maximize spillovers, and enhance linkages. And it would involve creating the conditions of upward mobility.

Several points need to be made here:

Tamil Nadu’s long term industrial strength cannot rest on low wages. Nor can Tamil Nadu’s industrial strength rest on the fortunes of one or two of its key sectors (e.g., high-tech, high growth export sectors), or on the prowess of one or two city-regions (e.g., around Chennai) that are the state’s engine of industrial growth. In order for Tamil Nadu’s industrial growth to be sustainable, it must be broad-based, involving both, a vital exports sector and a strong domestic base.

In much of the discussion in the previous sections, we have repeatedly seen that the “way of the future” for regions like Tamil Nadu lies in improving its technical and institutional capabilities to produce high-value goods for a diversified market at reasonable cost, rather than relying on low-costs alone. Implicit in this discussion is the issue of upskilling, upgrading of production processes, and customization and the production of high-value goods. Upgrading, upskilling, and customization and exports are important capabilities that will be critical to Tamil Nadu’s industrial future. But it is crucial not to make a fetish out of upgrading in ways that polarizes and segments the economy in unbridgeable ways between high-skill and low skill

exclusively used to enhance other services [real estate firms, lawyers, caterers, medical testing services]; and (3) firms providing services that are used by both manufacturing and service providers (banks, telecommunications firms, electric utilities, and advertising firms, and so on.)” [1997:29].
workers, high-value added products/sectors vs., low-value added tasks, export enclaves vs. domestic market, or customization vs. standardization.

Many studies have found that exports, without the simultaneous development of a strong domestic market, are unviable. Many studies have also found that while low skill, low-wage jobs are limited basis for long-term growth, the issue is not to view all low-wage, labor intensive jobs as representing the low road, or call for indiscriminate upgradation. The issue rather is to upgrade regional industry in a way that generates pathways to upward mobility, such as modernizing the skills in low-wage sectors one notch, at a time, to the next level.

Similarly, it is hard to tell a-priori whether customization is necessarily the best strategy for a firm or sector. Customization as a strategy is well suited to the development of niche markets. Niche markets proliferate today, and there is high currency attached to the ability of firms to identify customer needs and meet specific requirements. But not all markets are niche markets; and not all items that are in high demand are specialized items that call for customized production, design and delivery. Examples are wage goods, or simpler, sturdier and cheaper garments, footwear or durable goods sold in popular markets. These markets proliferate in developing countries and regions; and form an important entry point for many producers in the domestic market. These low-skill, low-value added industries can serve as important learning grounds for many firms; and can be viewed as halfway houses in the process of developing a production sensibility across a range of producers. They can certainly be more than just training grounds or halfway houses as firms move up the production chain. In many countries and regions these low-end markets can become an important element of a region’s overall growth trajectory. The question is to ask under what conditions is customization a successful strategy and under what conditions is standardization important.

Indeed, instead of thinking in terms of this dichotomy, it might be more useful to emphasize the circumstances, and processes that lead to learning, adaptation among firms, and which endow them with the ability to react quickly to crises, and adjust to changes in market demand and customer preferences, whether they are in low-value added or high value added sectors.

It is equally important to be careful not to create isolated pockets of growth amidst expanses of deprivation, but to try and foster links between different segments of the economy. Maharashtra, Karnataka, and in the US, regions like Georgia are examples of growth-pole based industrial economies where prosperity never really did reach beyond the major cities where the regionís industrial base was concentrated (e.g., Mumbai-Pune-Nasik in Maharashtra, Bangalore in Karnataka, and Atlanta in Georgia.)

Some of the strategies that might help go beyond this kind of enclave development might include: (a) balancing customized, high value added goods and services, with scale economies in the production of standardized, low cost goods and services; (b) widening access, and creating spatially dispersed, but networked “centers of small-medium firm
excellence” not just isolated enclaves; (c) providing collective goods, and production services that will maximize spillovers and benefit small, medium and large firms across the state; (d) building up the domestic market and not just fetishizing exports; (e) using new sector like Information Technology to widen access, and create tiers of upward mobility, (f) create deliberative institutions, and multi-agency programs that spread learning and “new” kinds of training, to foster a better kind of production sensibility.

This amounts to developing a different, alternative kind of industrialization, that is not only capable to producing firms that compete at the cutting edge—with commensurate skills and knowledge—but which are also able to create conditions for broad-based upward mobility. Large anchor firms, a strong tier of medium sized firms, as well as a modernized and dynamic segment of small firm are important and inter-linked, not dichotomized, parts of this kind of industrial path.

Let us look in particular at (d), (e), and (f) above to see exactly what these two strategies mean in terms of policy.

A new production sensibility:

Rather than pushing any particular kind of production arrangement (e.g, customized vs. standardized production, or high-value added vs. low value added), it is perhaps more important to push for a broad goal—of developing a productivity and quality-based production sensibility in firms across sectors, and across the size spectrum. The specific institutional arrangements, incentives and mechanisms through which firms of different sizes and sectors may attain this broad goal, may vary.

In this regard, the nature of the business environment, the nature of incentives provided through the state’s assistance programs, exposure to improved practices, and information about new markets—domestic as well as foreign is important. Equally important is to actively support learning-intensive linkages between firms of different sizes. This can take the form of cluster strategies built around horizontally linked small and medium firms; or production networks where groups of 10-14 firms work around a large anchor firm that had a tutelage relationship with its suppliers. Governments in some countries like Mexico, have tried to institutionalize this sensibility through developing multi-sector, public private technical assistance (or “learning”) programs that bring together firms of similar sizes from various sectors and expose them to the different ways in which these firms meet the respective quality standards specific to their industry.

In one case in Brazil, this concern for quality and cost was diffused widely across a “policy-induced” cluster of firms in the state of Ceara, through an innovative public sector procurement program. The innovation lay in the nature of the contractual arrangement whereby the government agencies signed a contract with the producer association of a group of small firms for procuring items like school-desks, and office equipment. The group was jointly
responsible for the quality and timely delivery of the equipment. The procuring agencies (the education department) were de-linked from the small-firm development agency that was mediating the contract, and that did not care whom they bought the equipment from as long as it was of good quality and low cost. An intermediary quasi-public technical agency who mediated the contract—and got a commission on its successful completion—provided each group of small producers with highly focused technical assistance, teaching them to fulfill the order on time and with consistency. Because of the commission it earned on each successful contract, it was in the interest of the technical agency to improve the skills of the small producers and ensure good performance. Each of the members of the group distributed the production tasks among themselves, and shared the learning. Indeed they put pressure on each other to do well, because their payment depended on successful completion of the full order, and hence the performance of the whole group. Over time, these small producers improved their quality and lowered their production costs to such an extent that they successfully won contracts from large private firms, in competition with other sophisticated producers, and eventually diversified away from their public sector buyers (Tendler 1997).

Similarly, in Hong Kong, producers of many labor-intensive products, such as mass-market garments, and standardized, low cost toys, often boast that they have won large market shares by providing “Japanese quality items at PRC costs” (Berger and Lester 1997). Even in these low-end markets, their competitive strategy in several instances is based not so much low-wages, as on the ability to respond quickly to new and emerging demand from new markets, or to reduce wastage and increase product variety. Eventually, some of these firms move out from low-end markets into higher, more demanding and more lucrative markets at home and abroad.

Thus, more important than thinking in terms of high value added vs. low value added, customization vs. standardization, is to think in terms of a new practice of production—or a new way of doing things that applies to all sectors, whether they are high and low-value added sectors. This new sensibility of production would be characterized, for example, by a concern for quality and consistency, the ability to make timely and speedy deliveries of goods and services; of being able to listen to, and discern, customer preferences and respond to them; to be able to handle open-ended problems innovatively, i.e., to be able to develop solutions to problems that they haven’t encountered before. To care for productivity and skills and learning. Most importantly, it implies being engaged in a process that is reflective and constantly under revision as new feedback becomes available from the very act of practice and performance. Some call this process “learning by monitoring;” (Sabel 1994), others call it “reflective practice” (Schon 1983).

The Role of the IT sector in widening access, rather than the gap between those who are linked and those who are not.

Information Technology is a key emerging sector in Tamil Nadu. And the government’s commitment to developing Information Technology in the state is clearly crucial. It is a burgeoning export industry and an important employment generator. But much more is at stake
here than developing a new export industry. As the Tamil Nadu government has astutelyealized, the IT-sector cannot be seen as merely an important export industry. It will radically
transform the way firms and governments carry out their business in the new economy, just as it
is likely to redefine training, learning, management, production and distribution. The IT sector
must be harnessed, therefore, to serve as the basis of a new manufacturing services
infrastructure for the region as a whole, that will increase the performance and productivity of a
variety of sectors, including the government. If used this way, as a basis for increasing
productivity across sectors, IT can serve in as an important bridging force, rather than as
mechanism of division.

Indeed, states like Tamil Nadu with their high literacy rates, English language skills, and
a tradition of strong tertiary education, stand to build huge advantages in this area. As Michael
Dertouzos, Director for the Laboratory for Computer Science at MIT, and co-author of a
classic study of the US experience in the 1980s and 1990s with industrial restructuring recently
noted, office work, and services like it, could be the most powerful source of on-line revenue
over the next few years. Office work, which comprises 50% of the industrial economy today, if
managed online could generate a market of up to “$4 trillion a year [online] worldwide” in a few
years. He further remarked on the comparative advantage that countries like India, with its
skilled workers and English proficiency, had in getting access to this massive market: “[w]ithin
five years, 50 million Indians, who read and write English and have office skills, will be ready to
sell their information work to us at bargain prices. Interconnected computers [across firms,
regions, and countries] will further automate many of the things we do with our eyes and brains.
People will collaborate over time and space wherever they may be. They will be able to
retrieve the information they want…; control their physical environment; and customize goods
and services to individual needs.” (New York Times, 1/16/2000. Emphasis added). In
order to leverage the potential of the investments that Tamil Nadu is making in the IT sector,
firms and workers will not only need to acquire the requisite skills, but most crucially, link up the
with new kinds of markets that are opening up, build new partnerships locally, cross-regionally
and cross-nationally, and nurture new connections. Once again, with these connections, the IT
sector cans a force of diffusing opportunities across the state, rather than creating pockets of
“privileged connection.”

As the Finance and IT-Secretaries pointed out, the Tamil Nadu government’s emphasis
on the development and diffusion of local language software programming, its plan to extensively
use IT in government (eventually) at the state and local level, and its efforts to universalize
computer literacy by including two-years of computer science in the curricula of all public sector
high schools in the state are a crucial set of policy initiatives that will help the state move in this
direction.

The IT sector also provides a powerful entry point to a lot of people with basic skills
and basic knowledge (e.g., language, basic computer science training, traditional skills, like
office skills), but little capital. As the careers of programmers and data-entry associates show,
these entry level jobs require little in terms of start-up costs, and therefore can be highly labor
and employment intensive, as long as there is a reliable market for their services. This craft-like, labor-intensive quality of the entry-and-mid level end of software industry should be exploited to create broad-based access to jobs, and to attract investment, workers, and resources into a growing industry. Expanding the low-end programming segment of the Software industry is one strategy that will help diffuse basic IT skills across the state. But it is important to recognize that moving up the value-added chain in this sector will require very different kinds of skills, than just expertise in programming. These skills include the ability to understand the structure of key markets, assess user needs, design products to meet particular customer needs, and crucially, project management skills to put new products together and successfully market them. These skills would be supported by the availability of dependable telecommunications capabilities, a vibrant capital market, including venture capital, and a hassle free regulatory environment. The government, together with industry associations and local universities have a key role to play in facilitating these skills, and ensuring that along with the spread of basic skills across the state, Tamil Nadu’s IT industry is also well equipped to move up the value-added chain, as we see in the next section. In making a strong start in carving out a multi-dimensional IT niche in the state with a long-run perspective, the Tamil Nadu government has made an excellent start along the right track.

SECTION 4
Creating a Skilled and Adaptive Human Capital Base:

Production skills: Mobility, upskilling, and focusing on “careers” not jobs
Managerial skills: Developing a new skills for a new kind of management sensibility

Turning around companies that have long been sheltered behind protectionist barriers, and improving their productivity and product quality so that they can enter new markets abroad, is a management intensive task.

In addition to improving production skills of workers on the shopfloor, the government and industrial associations in Tamil Nadu will also need to pay special attention to developing a strong and dynamic cadre of managers—in industry, and government—who understand the rapid changes taking place in the domestic and international economy. Whether running firms in the new sectors of the economy, or turning around old companies in traditional sectors, these managers will need a new type of skill-set. They will need to take risks; understand and apply the new production practices (innovation, learning, total quality management, the need to build markets rapidly, cut waste, and modernize production processes), cope with rapidly changing markets, deal with uncertain supply responses by their suppliers, make decisions on the basis of partial information, and learn to compete in an unpredictable, but interconnected world.
Indeed, some researchers have found that making low cost, low skill-based industries profitable in the current competitive environment (which demands good quality, consistency, reliability, and quick delivery even in low-end traditional products), is an especially management-intensive task. For example, in a study of garment firms run by Hong Kong based assemblers in Hong Kong as well as in China’s Pearl River Delta, Berger and Lester (1997) found that high levels of managerial inputs are essential to running the low-wage operations in China profitably. The Hong Kong owners filled all the top positions in the Chinese plants with trusted and experienced managers who were brought from the outside (PP 132). Turnover in the top ranks threatened productivity much more seriously in the low-wage Chinese plants than in Hong Kong, where firms relied less indispensably on a cadre of top managers for good performance.

More telling was Berger and Lester’s finding that the kind of managerial skills needed to make low-wage operations do well were different from the skills needed to run a more modern operation profitably. The skills that managers in low-wage operations used most involved: “coordinat[ing] and stockpil[ing] a quantity of supplies[inputs, and other items] that permit the plant to operate without shutdowns; to supervise the recruitment of new workers and rapidly train them to an adequate level of skill; to [troubleshoot] to rebalance the line [in the event of breakdowns], to repair machines, to replace workers, arbitrate workplace conflicts; to shield the plant against intrusions from…local officials, interpret the orders coming from headquarters, and from buyers too distant for face to face discussions” (pp. 132). Skilled managers were the crucial intermediaries in these plants, and there was much less transfer of managerial learning down the ranks because the “trouble-shooting” nature of the managerial task. By contrast, the set of skills that managers in advanced production sites typically have are very different: managing teams effectively, delegating tasks, managing plant level innovations, running just-in-time production systems that are closely coordinated with networks of suppliers, teaching new skills to the workforce in step with the introduction of new technologies, eliciting the group’s best efforts by enlarging the job and giving workers more control so as to improve the performance of the system as whole, to rotate workers through a variety of assignments to generate capacities to cope with rapid changes, to interact closely with buyers, suppliers, and other users. (Pp. 133).

The government, in partnership with industrial associations will need to nurture these new skills through active training programs and investment in broad-based research and development.

Research and Development, and the generation of new and evolving knowledge

Indeed, the success of the Indian software industry—including the recent rise of the IT sector in Tamil Nadu—demonstrates clearly that for firms to move up to a higher level of product development, more than good technical skills are needed. The evidence from Bangalore, and even Tamil Nadu, shows that it is naive to assume that those with basic
programming or processing skills can automatically move up the value chain. Key to the success of all the firms that have moved into the high-value added, product-development side of the IT business (i.e., beyond programming) were professionals with project management and product design skills. A bulk of them attained these skills from links with or serving in management intensive positions in the telecommunications sector, or in large, high tech engineering firms, R&D based institutions, or from state of the art technical university education. Thus, large (and medium) firms, universities, basic science based research institutions, and government agencies are likely to be the key interlocutors in creating the conditions for the development of these higher-order management skills. (See Amsden 1989, on the crucial importance of professional managers, and those with project management skills in producing the learning and broad-based production capabilities that enabled Korean firms to catch up with their more advanced competitors).

In particular, the government will need to nurture these kinds of R&D skills, and support the institutions where key skills and knowledge are created, even when the results are not immediately apparent. For example, many believe today, that a key factor behind the steep rise of India’s software industry in the 1990s was the fact that throughout the 1970s and 1980s, India’s IIT’s kept pace with new advances and breakthroughs in the IT sector in the West, particularly in the US. In continuing to build on foundations such as these, it is critical for the government of Tamil Nadu (with assistance and funds from the Central government) to work closely with universities at the cutting edge to create knowledge that is relevant to industry. It is also critical that in attracting new multinational investments to Tamil Nadu, the government make an effort to also attract firms that are willing to locate some of their R&D operations in the region.

At a different, programmatic level, similar kinds of institutional partnerships are needed to create new knowledge about the sources of effective public action within government. Few clear rules apply today in terms of what public initiatives will best support the process of industrial restructuring. The government of Tamil Nadu clearly does not have, and cannot have, all the critical answers. It is crucial therefore, for government agencies to develop close and collaborative ties with business associations on the one hand, and universities on the other, to constantly evaluate and reflect on their own practice and examine the empirical results of their past action to understand what kinds of initiatives, and practices were successful and why. As some analysts of performance-based governance have said, this amounts to learning lessons about effective practice by “beginning to just do it” i.e., setting initial goals and taking action; and then jointly (with industry and with the community) and carefully reflecting on what worked and why, what did not work and why not, and use this collective and open feedback to make changes to old efforts and develop new ones.

Indeed, there is a term for this kind of reflection in action—“learning by monitoring”—that some analysts (e.g., Sabel, 1994) have convincingly used to describe a key set of

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10 Cf. Dara O’Rourke.
institutions that help generate learning under conditions of uncertainty; especially when old rules do not seem to apply any more, and new rules are still evolving. We examine these institutions next.

**Deliberative Institutions**

Catching up and competing successfully in the current economic environment, requires, as we have noted before, a process by which firms can acquire technological capabilities, build new skills and competence, improve existing designs of their products and processes and learning how to enter new and unknown markets. What are the kinds of institutions or institutional arrangements that would help generate such a process of learning?

A key characteristic of deliberative institutions is that they trigger a learning process based on “Learning by monitoring.” This refers to a process like benchmarking, where firms and/or their public sector interlocutors, evaluate current practices, examine their own performance, establish goals and new standards and then act. They then evaluate their practice based on the standards they had set, and in the context of new comparative information about best practice, revise their means and even goals, and thus generate a capacity for continuous improvement. The organizational structure in which this type of learning is anchored is a group—a group of firms, government, or community agencies—acting and communicating together. Network forms of coordination between the actors who are part of these deliberative relationships (firms, business associations, government agencies, NGOs) and regulation at the micro-level, encourages innovation by balancing reciprocity, and cooperation and competition.

**Example of a “deliberative institution:” Export success and the re-making of Chileís agro-processing association through transformed inter-firm and firm-government relations**

The reorientation of one of Chile’s most powerful associations, The Federation of Agroprocessors (FEPACH) illustrates how the state has constructed new connections with groups of private enterprises, encouraging them to seek new ways to improve the production performance of firms. After market reforms in the late 1970s, the Chilean government went beyond macroeconomic management to create a set of developmental associations, or groupings of firms, who worked with the state to compete in demanding markets.

Under the import substitution regime, the agroprocessors association (ASFACO in as it was earlier called) had been consumed with dealing with the monopolistic position of the state’s steel company, and the issue of price controls on food items. After the adoption of market reforms, these concerns ceased to be relevant. Foreign imports ended the state’s monopoly over steel, and the government removed price controls over food (Perez-Aleman 2000). What ASFACO had to offer to its members was now obsolete in the new environment. The new concerns were about how to meet international standards to compete in the face of increased competition. The government, (via its development agency, PROCHILE) re-organized the association of agroprocessing firms into sector specific export committees that would then
define a project that they wanted assistance with. The projects fell into two categories: (i)-improving quality to meet international standards; and/or (ii) developing new products.

The government encouraged firms to improve their products by using international standards as a reference, thus shaping the firms’ goals in the process. The major requirement of the project was that firms work in groups. Only firms in a group (each group comprised of 6-14 firms) could receive financing from the government, nor individual firms. And the government financed up to 50% of project costs of groups trying to learn how to promote exports.

This effort by the Chilean government not only helped firms get targeted information about how to improve product quality, but it created a common sense of identity among large and small agro-processing firms in Chile given the “forced” group nature of their collaboration. Through their joint work, firms identified the need for uniform quality standards across the group as key to the process of becoming reputable exporters. Eventually the association became cross functional and brought in all the various agroindustrial subsectors—including producers of frozen juice, dehydrated products—which helped improve quality across the supply chain. This boosted exports, and ultimately, made Chilean processing firms less dependent on export traders or foreign customers as their sole source of information on foreign markets and technology; and allowed the agroprocessing sector as a whole (not just a few firms) leap to being the third largest exporter internationally.

This example of how deliberative institutions work to enhance collaboration as well as competitiveness of a whole sector holds important lessons for how some of Tamil Nadu’s existing sectors may restructure themselves, and the role that the state can play in that process. The specific case of Tamil Nadu’s engineering, textile and leather sectors will be examined the three industry studies to be conducted over spring 2000.

SECTION 5
Revising the Image of Government: Reform and Dynamism within the Public Sector

As the nature of industrial competition changes in the new economic environment, one finds that firms learn more by making strategic links across functional boundaries—e.g, product design engineers benefit greatly from direct feedback from marketing and sales personnel, and from customers, and direct users. Suppliers from buyer firms; large assemblers from their small parts producers; and so on. This cross-functional nature of feedback is also what works best as the bureaucracy assisting firms itself adapts in response to the challenges faced by the firms they seek to assist, and the changes taking place in the economy. For example, as supply chain development becomes a cornerstone of regional industrial growth, governments are finding that they have to reorganize the old, strictly functional bureaucracies to get officials responsible for...

11 There are several key issues regarding the issue of public sector reform in Tamil Nadu that are being addressed in a separate paper, as noted in footnote 7.
different parts of the supply chain to work together so that concerted changes can be made to
different parts of production chain in order to benefit the sector as a whole. [e.g., in the textile
industry, bringing together the departments responsible for spinning and weaving with the
agricultural department to increase cotton output and improve yarn quality].

To generate learning that spans boundaries, a new kind of coordination is necessary—
within government, as well as between government and industry. One element if this new
coordination is the group nature of the interaction: that is, it is more efficient for firms to learn as
a part of teams, inter-linked groups, or networked clusters than as single, isolated units. This is
especially true for small firms, whose weaknesses are often more a result of their isolation, than
of their capabilities. At the same time, it is also cheaper and more effective for government to
support groups of firms, rather than target their assistance individually to isolated firms. A
second element of this new coordination system, is the need for both firms, and government
bureaus to develop a cross-functional style of operation. This cross-functional character of
work is exactly what has been inadvertently generated in the Tamil Nadu government as the old
bureaus of Finance, Industry and agencies like TIDCO and SIPCOT have come together to
create new leadership in a key set of emerging sectors, such as information technology, human
resource development, and the general area of FDI policy. Developing a relevant and viable
IT-Policy requires these separate departments to work together, and in so doing to redefine
their tasks as well as re-draw more flexible boundaries between their individual roles and
respective responsibilities. This same pattern is reflected in the structure of the Industry
Department’s innovative new cross-departmental working groups led by the Industries
Secretary (Mr. Srinivasan) to expedite significant new investment projects.\(^12\)

It is interesting to note that in this new reorganization, there is neither a clear
decimalization, nor a clear centralization of action or decision-making. Rather, there is an
important dual dynamic that simultaneously centralizes and specializes certain tasks (e.g., the
creation of a new IT secretariat), while decentralizing others. Even while all line departments
contribute to the formulation of IT policy—which is centralized in the IT secretariat—much of
the actual implementation of IT-related programs is still carried out by the specific department
closest to the substantive area that the project or program addresses. For example, the
education department, industry department, and ELCOT are the chief implementers of the
government’s IT-literacy program in all the state’s high schools; and a ‘consortium’ of
agencies—public, private, state as well as national—is involved in the implementation of the IT
Park (TIDEL) project as well as the WorldTel program). This tension is crucial to good
performance; and it represents a new kind of network sensibility where government agencies
are simultaneously linked by parallel, horizontal, and vertical coordination to other public,
private, and commercial agencies; all of whom are held together by individual as well as group
accountability. The effectiveness of the Industries’ department’s innovative initiative of
accelerated project approval, for instance, depends as much on the performance of the
Industries Secretariat, as on the performance of the other departments that the Industries

\(^{12}\) This program will be analyzed in more detail as part of the paper referred to in note 7 and 11.
Secretary coordinates during the joint meetings. Ultimately, the effectiveness of the initiative as a whole is the joint responsibility of all the agencies involved. The improved recent image of Tamil Nadu’s bureaucracy as a pragmatic, proactive, effective and investor friendly administration is a result of this kind of joint good performance by a key set of bureaus. The results are concrete, and lie in success of the state in attracting several key foreign and domestic investments to the region, and the accolades the government has won from private industry (Ford interview, 1999, L&G meeting, 1999, and CII, interview 1999)

These changes, and their results, are creating a new identity within Tamil Nadu’s bureaucracy—an identity of dynamism and creativity in public action, situated within a broader context of rule-based decision making. Examples of the latter relate to issues of transparency that the government has assiduously pushed over the last few years. For instance, several officials made a point of noting in their interviews with me, that after the new government won elections and took over power from the previous party three-four years ago, “the [present] government made sure that all pending agreements and contracts made by the previous government were honored; that all FDI projects pending approval were cleared (or are being cleared).” This very public and deliberate adherence to past commitments is an important part of the effort by the government to create an image of a credible, reliable, rule-based administration, that is not apt to political swings despite changes in the party in power at the state level.

The lesson here relates back to the issue of developing a new image of credibility and accountability. Even as the Tamil Nadu government initiates innovative new experiments, such as its WorldTel, Community Internet Access program, and its initiative to introduce computer science instruction in all high schools, the government is finding that it needs to remain open to revising the means by which it hopes to achieve its goals in response to the new information that the implementation process is generating. To retain credibility and maintain accountability to the public in an open, experimental, process such as this, two ingredients are key: emphasizing public knowledge, publicity and information. As in the case of the government’s WorldTel program, the most empowering victories for the government are those that are very publicly won. For example, in order to bring the different political and community constituencies on board with its plans, the government had to publicize the program heavily, and win public support for it. This was significant precisely because the guise in which the program gained its greatest popularity emphasized the “public-good” character of the program—of setting up subsidized internet centers in communities across the state, eventhough the biggest ticket item was an expensive international collaboration around a high-tech, infrastructure installation. Without publicity and debate about the project (even if the public discussion focused only on one half of the project), the government would have opened itself up to far fiercer political opposition and suspicion, against the project as a whole. For reform to be effective, and successful, it has to be politically relevant.

Another example of the importance of publicity and public accountability comes from efforts of the state government of Ceara, in Brazil, to pull off a highly successful public health
project that dramatically reduced infant mortality rates in a short period of time (about 2-3 years), at very low costs. The project involved the hiring of over 6000 field-level public health workers—just the recipe for rent-seeking because street-level workers are so hard to monitor. Yet, an innovative three-way dynamic between the state government who recruited the workers, and the municipal government whose nurses supervised their work, and the community that provided enough checks and balances to prevent any possibilities of corruption. The key to the project’s success lay in the way in which the health workers were recruited. When government officials interviewed local workers to hire them, they took pains to describe fully to each interview (who was also a local resident) exactly what the responsibility of the health worker was. They were told “this is what the health worker is supposed to do. We want you to know that even if you are not hired this time; we would urge you to monitor those who are hired. If they deviate from their task, we would like to hear about it. And who, knows, you may yet be hired in their place.” The government heavily publicized 1-800 (free) numbers where local citizens could call them with complaints, and in many cases did take punitive action. In this way, a powerful public constituency became the key monitors of a vast bureaucracy that ordinarily is hard to monitor (Tendler 1996).

Indeed, public campaigns against corruption have a history of success in other countries as well. Hong Kong’s public institutions are regarded today as some of the most efficient and transparent institutions that are authoritative decision-makers. But, as the following example cited in Berger and Lester (1997) illustrates, they were not always so. The current reputation of Hong Kong’s public officials as honest was the result of a deliberate and long-standing effort by the bureaucracy to “keep government clean.” A key agency that helped reverse the strain of corrupt practices in Hong Kong’s government agencies, was the Independent Commission Against Corruption (ICAC) set up 20 years ago? A key component of the agency’s effort is public outreach. In this regard, ICAC has created a strong external and educated constituency among the citizenry that can monitor and hold public institutions accountable for their action. ICAC’s public outreach activities involves programs in schools and in community organizations; they produce advertisements, and run a very popular TV series based on real ICAC cases (of corruption) which is watched by about 2 million people. Through these efforts carried out over the years, ICAC has succeeded in reversing a legacy of public indifference and resignation about corruption. One measure of the public trust in this institution is the number of persons who call and report problems and are willing to identify themselves (65% in 1997 compared to 33% in 1974 when it was first set up.) [Berger and Lester 1997: 47] This issue of creating a port of call where those who experience problems of corruption can call and report complaints is similar to the Brazilian case reported above, and as powerful.

A final example of some elements of successful public sector reform comes from the recent experience of the US to “reinvent” its bureaucracy to make government “work better and cost less.” The US reforms have gone through several phases. Two of the key phases are “entrepreneurial” reforms, and the more interesting, “agency-level” reforms. The latter was aimed at increasing the efficiency of various public sector agencies, and resonates more clearly with the Tamil Nadu effort. But first a brief summary of the ten principles of the “entrepreneurial
reforms.” 1) Focusing on steering, rather than implementing; (2) empowering communities instead of merely delivering services; (3) encouraging competition rather than monopoly; (4) focusing on missions rather than rules; (5) funding outcomes rather than inputs; (6) focusing on the needs of customers, not the bureaucracy; (7) concentrating on increasing revenue, not just cutting spending; (8) investing in preventing problems rather than seeking to cure them; (9) decentralizing authority; (10) leveraging the marketplace instead of creating public programs.

The agency-based reforms were more subtle and with potentially greater sleeper effects. These efforts were based on the premise that reforms must be prioritized and sequenced. If regaining credibility is a key goal of the reform, then it is useful to begin by reforming those agencies first with whom the public has the greatest degree of everyday contact. Hence the agency-based nature of these institutional changes. Like the Tamil Nadu government, the most extensive changes that the government made was in contracting out services and procurement. Rather than implement all of its own programs, the government built partnerships. It emphasized “customer-oriented” service delivery, and developed one-stop information and service provision just like the Tamil Nadu government has done with its Guidance Cell. The heart of the reforms, however lay in creating deliberative alliances between government agencies and the public by intensifying public information campaigns akin to the efforts described in the above two cases that created monitoring constituencies outside government. On the inside, the government publicly rewarded the work of innovative reformers with awards and public citations. At the same time, it improved the quality of appointments at the top among the most troubled agencies (Kettl 1999). Strong leadership is key to effective reform, as the Tamil Nadu case itself illustrates.

The challenge that still remains is one of building processes that help provide answers to the question of what to do when the old regulations do not apply anymore, and it is unclear what the new rules ought to be. How do you attain legitimacy and credibility while the new rules are being crafted? The answer, once again, relates to the power of image, and the real achievement of concrete results. From the recent successes of the Tamil Nadu government in successfully attracting three of the world’s best known automobile makers, harnessing new and emerging sectors such as information technology, and at the same time seeking to spread new opportunities across the state, it appears that the Tamil Nadu government is well on its way to achieving both: a credible image as a rising industrial power, and promising results that are broadly diffused across the state and social classes.

In conclusion, therefore, the task of improving industrial performance in the face of greater openness, is not simply a task of deregulation and market reforms; it involves redefining how the public sector relates to institutions of the economy. In particular, industrial growth that succeeds in bridging, rather than further exacerbating the dislocations that restructuring and open competition will inevitably cause, is likely to be industrial growth that is based on broad-based economic mobility. Such growth would widen the access of firms and workers to productive resources, and to new knowledge, and to sources of upward mobility. This will involve designing and implementing policies that attend not only to the high-growth export industries that
are at the cutting edge of technology, but which also deepening the capabilities and productivity of the more traditional sectors from which Tamil Nadu draws its largest employment base. This depends upon modernizing existing core sectors, creating new knowledge and capabilities within firms as well as government; and paying attention to how this knowledge is diffused across firms, sectors and localities. The governments will, therefore, have to be proactive and innovative in formulating industrial policies that comply with WTO rules, leverage market reforms to boost industrial dynamism, but also work to simultaneously counter the regressive and polarizing impact of trade liberalization on regional industry.
New directions of industrial policy under WTO rules and agreements

Even as the WTO rules are under negotiation and are almost certainly likely to change after upcoming rounds, it is important to layout the emerging directions in which industrial policy is likely to evolve under the current WTO rules.

Primarily, reductions in tariff rates and eventual elimination of non-tariff barriers are likely to be the clearest areas of action under WTO agreements in the near term. Elimination of tariffs and many other subsidies familiar to Indian policy makers of years past clearly does not mean that there is no room for public sector support for industrial development or for targeted industrial policy. To understand the likely new space for industrial policy under WTO agreements, important distinctions will need to be made about what kinds of industrial support are permitted under current rules, and what are not.

For example, on the one hand WTO rules prohibit a variety of subsidies including explicit export (performance) subsidies and local content requirements. Most Industrial countries adopted these restrictions after the Tokyo Round; and since then, many of these restrictions have also been extended to developing countries subject to the rules on special and differential treatment that the current agreements uphold. Yet, on the other hand, WTO rules still continue to allow many types of government support to industry. These include: (a) government provision of equity capital, (b) loans conferred by governments at interest rates at par with commercial rates, c) loan guarantees by governments and government institutions, and (d) the provision of goods or services by government, as well as the procurement of goods and services by government. Similarly, only those subsidies that meet the “specificity” criteria of WTO rules are barred (specificities can be of four kinds: enterprise specificity, industry specificity, regional specificity, and local content/export specificity). However, “where a subsidy is widely available within an economy,” it is not considered distortionary under WTO rules and is not prohibited.

Further distinctions are to be made between subsidies that are 1) prohibited outright; 2) those that are “actionable” i.e., they can be challenged by member states; and 3) those that are non-actionable. As noted earlier, explicit export subsidies and local content requirements are “prohibited” subsidies; and a vast range of production subsidies fall under the “permitted but actionable category.” However, it is the third category, of non-actionable categories of subsidies that form the heart of the new industrial policy terrain under WTO. This terrain, if creatively used, dovetails quite neatly into the demands of the new competition that we have been talking about in the main body of the paper.

There are three key areas, listed below, that are the primary focus of industrial support and can be the main target of government action under WTO.
1. Basic research and areas of pre-competitive development subsidies

These subsidies (and related efforts by the government) are meant to support “industrial research” or critical investigation aimed at “developing new and innovative products and processes, or services, and bringing about significant improvement to existing products, processes, and services.” This is exactly the direction in which the new competitive pressures are pushing regions like Tamil Nadu. This category of subsidies also supports the development of designs, prototypes and blueprints for new, modified, or improved products, pilot projects, or ideas for demonstration projects. The only requirement is that these subsidies do not support routine alterations to existing products even if those alterations represent improvements. It would be useful for government policy to build upon and around these incentives as the Tamil Nadu government pushes its firms in new directions. [However, R&D activities in some industries—like civil aircraft—cannot avail of non-actionable subsidy status. It would be useful to see where further negotiations in this area lead.]

2. Assistance to disadvantaged regions

The second area of government support allowed under current WTO rules are area-based regional policies. According to the rules, “regional aids are non-actionable provided that they are not limited to specific enterprises only, or only to some industries within the region;” but that they be awarded “pursuant to a general scheme of regional development, and that the region be disadvantaged.” [A region is considered disadvantaged if its household income per capita, or GDP per capita is below 85% of the average for the territory concerned, or if the unemployment rate of the region is at least 110% of the average for the territory as a whole.]

Potentially, area-based cluster development strategies, or regional strategies aimed at providing collective goods (like infrastructure support and other production services) across sectors, that make it easier and cheaper to conduct business in a certain region would fit with this clause; as would broad-based educational initiatives and multi-industry training programs that seek to lift up the skills of the regional workforce as a whole. Projects aimed at providing affordable housing, basic infrastructure and services to create livable cities across the region could also be supported under this category.

3. Assistance to adapt existing facilities to new environmental requirements

This is an important area of future policy action, where developing regions, especially, have a long road to traverse. The support allowed by WTOs current rules under this category of industrial assistance is hardly adequate, but it is a start. As of now, the rules permit member governments to provide one-time support to cover up-to 20% of the costs of adapting existing production processes (in specific industries and firms) to meet new environmental requirements. This assistance is available to all firms, which can adopt new, compliant processes and equipment.
Research and development targeted towards the development of environmentally compliant technologies would, in many cases, generate important spill-overs that would go beyond specific product-lines. By producing new knowledge that could improve in-process production efficiencies across a wider set of linked product categories, and even related sectors, these R&D efforts, if diffused widely enough, could enhance the efficiency not only of specific firms, but of the entire production chain of which these firms are a part.

There is much discussion in advanced industrial economies today about pushing to go beyond the current trend of developing environmentally compliant end-of-the-pipeline technologies. There is a growing concern for developing in-process improvements that ensure that the production process across the life-cycle of a product is environmentally compliant. Clearly, this life-cycle approach comes associated with costs that most developing countries cannot currently afford. Yet, it would be wise to stay tuned to the efforts being made by cutting edge firms in advanced industrial countries, and to encourage strategic research in process improvements at home, that increase both productivity and profitability while being environmentally sound. Export oriented FDI, and cutting-edge multinational firms locating in Tamil Nadu (such as Ford, and Mitsubishi) can serve as important partners in such efforts.

Thus, according to current WTO rules, as long as a subsidy fulfills any of the three conditions listed above, it will be considered non-actionable, even if it is only specific to a group of enterprises. And as indicated above, the government can creatively use the space allowed by each category to develop an innovative industrial policy agenda that improves the competitiveness and adaptiveness of regional industry, while being compliant with WTO rules. It would also be useful to follow closely where further negotiations take these clauses and categories, and to indeed influence the direction that further negotiations are likely to take in ways that help boost the competitiveness of regional industry.

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13 Other ways in which countries that have been successful in handling the WTO requirements even as they support their industries is by (a) providing a window to set specific tariffs in particular markets. This window has been used by many countries to impose politically difficult deadlines domestically, for firms to comply with deregulation. In other cases governments have used these windows sequentially to strategically set up automatic sunset measures for the use of subsidies that will soon have to be removed. (b) A second way has been for countries to complicate the tariff structure while still being in compliance with WTO. This involved calling for extensive review procedures, and multi-tiered affiliations to regional groups, like NAFTA, for instance, or ASEAN, where countries are able to negotiate bilateral, voluntary agreements and restraints.
Appendix I

Bibliography


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WTO website on: http://www.cid.harvard.edu/cidtrade/
Appendix 2

LIST OF INTERVIEWS CONDUCTED: CHENNAI & NEW DELHI
8/18 – 9/1/99

NEW DELHI

1. Apoorva Kumar, Textiles Procurement, India region for Samsung Corporation.
2. Turner Morrison, New Delhi
3. Wool and Woolen Export Promotion Council, New Delhi
4. Cotton Textiles Export Promotion Council, New Delhi (Texprocil)
5. Protech, Green Park, New Delhi
6. Mr. Pradeep Srivastava, NCAER
7. Mr. Rajesh Chaddha, NCAER
8. Mr. Venkatesan, NCAER

CHENNAI

9. Mr. P.V.Rajaraman, Finance Secretary
10. Mr. M.S. Srinivasan, Industries Secretary
11. Mr. Praveen Kumar, Jt. Secretary, Industries Dept, GOTN
12. Mr. D. Prakash, Secretary, IT Department, GOTN
13. Ms. Sosamma, Secretary, Small Industries Department
14. Ms. Jayanthi, Secretary Handlooms (and Textiles) Department
15. Mr. Rameshwaram Misra, Commissioner Industries and Commerce
16. CII, Mr. Rai and Mr. Samuel
17. Professor U. Shankar, Chairman Madras School of Economics
18. Mr. Davidar, Director, Handlooms and Textiles, and his additional director.
19. Mr. Prabhakaran, CMD, TIIC
20. Mr. Gnanidisekan, Chairman, ELCOT
21. Mr. R. Gopalan, CMD TIDCO, Mr. Manivannan, TIDCO, Mr. Shanmugasundaram,
   TIDCO
22. Mr. Velumurugan, GUIDANCE
23. Ms. Quidsia Gandhi, SIPCOT
24. Mr. Kathiresan, CMD, Council of Leather Exports
25. Meeting between government officials and IOC convened by Industries Secretray
26. Mr. Satyagopal
27. Ms. Padmini Swaminathan
28. Mr. Anil Rathore, VP External Affairs, Ford India Ltd.