

# Preface

This study investigates the use of IT in Indian manufacturing units. IT using units clearly show better performance indicators in terms of profitability and labour productivity. This leads to the following question: does IT use result in better performance or, is it that the better performing firms invest more in IT?

A rigorous analysis was carried out to establish that IT use leads to greater profitability, workers becoming more productive and greater degrees of employment for both skilled and unskilled workers, though the ratio of skilled to unskilled labour increases with IT use. Most importantly, IT using companies pay more to their workers and employees for lesser hours of work, i.e., the quality of jobs is better with IT use.

IT is not a way of doing business, as yet, in India. This study notes that the only city that has taken to IT with any degree of seriousness is Delhi. The low level of IT use is borne out by the fact that management, clerical and marketing employees have greater access to computers and internet than skilled workers. However, a positive finding, though only suggestive, is that IT can often act as a substitute for lack of resources and direct connectivity to markets. Is the use of IT just another factor of production? Is it a fancy new input, or simply a fashionable thing to do? More importantly, does it have a positive contribution to changing the way business is done? A survey of international literature suggests that IT use positively impacts overall growth and firm productivity in both developing and developed economies. Most importantly, as IT penetration increases, firms are able to change their organizational structure to allow quantum jumps in productivity and profitability.

We see low IT penetration in India and establish the fact that most of India's IT and ITES prowess is meant for the foreign market with little or no presence in the domestic market. IT use in manufacturing has been increasing over time but is yet to penetrate uniformly throughout the country. For instance, large units are more computerized compared to the smaller units. IT use is often quite different across different industries and different regions. While the average use of IT is large in certain industries (e.g., printing and pharmaceutical), units in the Northern and Western parts of India are more IT using than those in the Eastern and Southern parts. The irony is that everyone acknowledges that IT use affects the performance indicators of the factories that do invest in IT. In particular, greater IT use is associated with better performance. IT using factories enjoy higher profits, employ more people and offer them greater remuneration for lower hours of work. A series of rigorous analytical modelling exercises were undertaken to establish these conjectures that followed from a descriptive reading of the data. Our empirical analysis confirms that IT use boosts productivity and profitability of factories. IT use raises employment and wages and lowers person days. Together, these imply that IT improves job quality.

In a competitive environment, which the Indian manufacturing sector has been facing since 1991, it is important to explain why this positive impact of IT is appreciated by only some and not all firms. In a competitive environment with free entry and exit, efficient firms will enter and drive out the inefficient ones. Thus, if the use of IT makes firms more efficient,

profit making firms have an incentive to invest in IT. If some firms do not do so and continue to exist in the industry, it must be because of constraints that prevent them from adopting the best available technology. The major barriers to IT use were opposition from labour unions, irregular power supply and lack of skilled personnel, in that order.

While IT helps individual firms, its major impact is observable when there is significant IT penetration both within and across production units. This works through two distinct avenues. First, with significant penetration levels within units, it is possible to bring about organizational changes that completely recast the way operations are handled within the company. Not only does it improve productivity, it also changes the organization of labour and skills. Second, greater penetration across units results in networking advantages. Gains from IT use can be multiplied several-fold if everyone uses it. This greatly reduces the transaction costs of doing business.

The best example is Haryana where the state government's initiative in computerizing business tax administration has greatly reduced the time spent by businesses on meeting tax obligations, increasing revenues for the state government and attracting businesses. This also has a positive effect on transparency that helps in improving the competitive environment.

The problem with achieving network benefits is that it requires a minimum amount of penetration — a threshold level beyond which network effects start showing up. This was evident from the detailed studies done with the US data where positive effects of IT use showed up only after the mid-nineties though investment in IT had started well before then. This leads to a dilemma for units deciding whether or not to invest in IT. To get the maximum benefit, everyone else must be using IT so, why not wait till everyone else uses it. This sort of reasoning slows down IT penetration. Clearly, the government can play a very positive role in overcoming this sluggishness in the adoption of IT. If most government dealings are through the use of IT, businesses get an immediate benefit of using IT themselves and are encouraged to invest regardless of whether others are doing it or not.

The question then is: why would the government want to take the first steps in IT investment? The answer is obvious. Computerizing government dealings have an immediate impact on record-keeping, reducing corruption (through recording every transaction and ensuring that once recorded it cannot be tampered with), improving monitoring and hence, increasing revenues. These are independent of how much IT penetration is there in non-governmental entities. To make IT use more pervasive, there is no single policy change that is sufficient. Instead, action is needed on a number of fronts that will result in a complete transformation of the way of doing business. The Information Technology Amendment Bill proposes to put in place technology applications, security practices and procedures. The bill addresses the issue of technological neutrality in IT laws as recommended by the UNCITRAL Model Law on Electronic Signature.

India is a signatory to the Information Technology Agreement (ITA-1) of the World Trade Organization and with effect from March 1, 2005, the customs duty on all the specified 217 tariff lines has been eliminated. All goods required in the manufacture of ITA-1 items have been exempted from customs duty subject to actual user condition. IT software has been exempted from customs duty. At the same time, custom duties have been

removed on specified raw materials and inputs used for the manufacture of electronic components as well as on optical fibres and cables. Some specified capital goods used for manufacture of electronic goods are also exempted from all custom duties. However, the excise duty on computers is still at 12 per cent.

Broadband penetration in India is still too low. South Korea and Hong Kong lead the way in broadband adoption, boasting penetration levels of 62 per cent and 57 per cent respectively. On the other hand, even urban India has only a 3 per cent adoption rate among its top three socio-economic classes (SECs). There must be a quick roll-out of 3G facilities so that telecommunication companies can provide value-added services to make up for the loss of conventional internet and voice business, which one expects to shift to the internet. 3G is essential for reaching internet services to remote rural areas and, hence, the 3G roll-out will have to be fast tracked. The government also plans to allow more long distance players and route all internet traffic through the National Internet Exchange of India. Most industry watchers believe that this will foster competition and make free broadband viable.

Industrial growth in the US in the mid-nineties picked up because of rapid inroads made by IT in the production process. IT resulted in significant changes in the way business is done and organized in the US. This is true for other developed countries too. However, in the US, though IT penetration started well before the nineties, the positive impacts started showing up from the mid-nineties. Improved productivity was usually associated with organizational changes that accompanied IT penetration. This was referred to as a crucial aspect in the empirical studies on productivity. In general, in most economies the firms that use IT were more profitable and the workers in IT using companies were more productive. The obvious question is: how much of this is relevant for India? In Indian manufacturing units, the companies that used IT in their factories had higher profitability and their workers had greater productivity. What was special for India is that IT using companies employ more people; the total number of workers, both skilled and unskilled, is higher for IT using firms though the ratio of skilled to unskilled labour is higher with IT use. The study ends with some policy implications that follow from our analysis. These implications include developing a legal framework to facilitate electronic business, greater flexibility in labour laws, support for wider broadband access and local-language software and content and general policies to overcome structural constraints to IT adoption, including network effects.