Manufacturing vs. Services and the Role of Information Technology

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INTRODUCTION

The role of technology in the context of structural changes of economies is often debated, mainly due to the mixed empirical evidence on the relationship between the technology adoption and productivity enhancement across countries. This has led to a policy debate regarding technology adoption by countries. In the context of developing countries, the debate is more on the appropriate set of technologies to be adopted rather than whether increased use of technology should be embraced. The endogenous growth theories (Romer, 1986; Rebelo, 1990) explain the role of technology as set of externalities which offsets the diminishing returns to capital. However, it is widely recognized that modern information technology (IT) is distinctly different from some of the past technological breakthroughs like industrial revolution. This difference comes from the unique feature of the use of IT which results in increased separation of the economics of information from the economics of things (Negroponte, 1995). In recent times, a number of studies have explored the role of IT in explaining the convergence of growth rate among countries (Rodrick, 2012l Greiner et al., 2016). However, there is a dearth of adequate studies on the impact of information technology revolution on the broader socio-economic context or structural transformation of a country. The present chapter aims to understand the same by analyzing the rather unique pattern of structural transformation of the Indian economy, which is characterized by predominance of services sector mainly led by IT services.

The services sector, which now accounts for close to 60 percent of total GDP of India, has been playing an instrumental role in stimulating the growth of the country. A closer look at the GDP composition of India since independence reveals that while the share of agriculture declined and that of industry stagnated, services sector's share has exhibited an increasing trend to reach at 58 percent in 2009-10 from around 30 percent in 1950-51. The stagnating share of manufacturing and in contrast to that, rising share of services in GDP, is something noteworthy if one compares it with the structural change of countries comparable to India in terms GDP per capita. In most of these countries, the structural change has taken place in a common manner where an initially agrarian economy goes through the phase of industrialization, and then at a more advanced stage, services sector predominates. Many researchers concluded that India has leapfrogged the phase of industrialization and instead directly moved to a service-led growth phase. In the case of India, the stagnating share of manufacturing in national output as well as its reduced share in organized sector employment during the last two decades presages a phenomenon of de-industrialization (Chaudhuri, 2015). Does technology play a role in explaining the strange structural change of India? What is its impact in terms of employment generation and export performance? The chapter analyses some of these questions in detail. The analysis presented

in the chapter adds country-specific insights to the literature on the role of technology in economic development and structural change.

The remaining part of the chapter is organized as follows: the next section of this chapter presents a brief discussion of the existing literature on structural change and the role technology plays in it, followed by a description of the Indian experience of structural change in section 3. The later part of the section 3 also delineates the services sector in its present form in India. Section 4 and 5 provide an assessment of the consequences of services-led growth that India has experienced regarding employment and export performance, respectively. Finally section 6 concludes the chapter with policy implications that follows from the analysis and aims at making the technology services driven growth of India sustainable in the longer run.

BACKGROUND

In this section, first, we present a summarized description of existing scholarly works on structural changes of the economy. The second half of this section traces out the role of technology in the context of structural transformation.

Literature on Structural Change: Concepts and Theoretical Underpinning

The traditional literature of structural changes, describes industrialization as a main catalyst of technological innovation and productivity enhancement (Verdoorn, 1949; Kaldor, 1967). However, the same literature defines services as the outcome of "unproductive labour" (Smith, 1976), *i.e.,* products of labour that perishes the moment the labour is performed. However, a greater integration of national economies since the era liberalization has resulted in increasing importance of the services sector through international trade. In a similar fashion, we observe that

the literature on structural change and economic development during the 80's and 90's have started recognizing the potential role of services in the development process (Francois, 1990; Eswaran & Kotwal, 2002). There is no consensus in the literature regarding the relative efficiency of industry or services-led growth. However, when the sectoral composition of output of a country increasingly moves towards services at the expense of manufacturing before the country reaches a high level of per capita income, a phenomenon often termed as de-industrialisation (Rowthorn & Ramaswany, 1999; Palma, 2005), it affects the employment generation and income distribution of the country.

A parallel stream of empirical literature probes into the relative importance of services versus manufacturing in the growth process across countries. (Eichengreen & Gupta, 2013) Many countries have experienced the wave of service-led growth twice in their growth process; once when they move from lower income to lower-middle income and again when they move from middle-income of upper-middle income. The first phase of services that had predominated the growth process while countries moved from lower-middle income to middle income were mainly low-end services. In the latter phase, services were mainly high-skilled and technology embedded. The second wave of services is more predominant in countries with strong democracy and locations closer to the financial hubs. One of the most important reasons underlying the services-sector boom in many countries is the "splintering effect"-the increased use of services by industry of these countries (Francois, 1990). This happens due to the change in production technology and subcontracting of services by many manufacturing firms, as they grow larger in size. According to some studies (Gordon & Gupta, 2005; Shingal, 2014) the boom of the services sector in India is attributed to demand-side factors, such as increased use of services in the manufacturing sector, and increase in domestic and foreign demand for services. From supply side factors, the reform and increased

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