



# The development of manufacturing: Unintended consequence



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## ABSTRACT

Structural change has taken divergent paths in India and Bangladesh. Using a dual economy perspective it is hypothesized that structural change is related to the intersectoral terms of trade. That is, the share of manufacturing in the economy falls as the price of agricultural goods rises relative to that for manufacturing and vice versa. This hypothesis is tested using data from the two countries and is found to be valid. Further, the differing movement in the intersectoral terms of trade in the two countries is found to be related to the type of policy followed (especially with respect to agriculture).

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## 1. Introduction

Dualistic models of economic development have provided an insightful view of the role of structural change. These models grew out of the work of Lewis (1954) and Ranis and Fei (1961). In these sorts of models the economy in a developing country is divided into sectors, at least two, in which labor productivity varies dramatically. One sector is often called modern or manufacturing or industrial and is characterized by high labor productivity. The other, often called traditional or agricultural, has very low labor productivity. Of course, at a given time period there are sectors having low labor productivity and others having high labor productivity, since growth and development are uneven processes. However, what distinguishes developing countries is that these differences seem to persist over very long-run periods of time. Even more striking is that these productivity differences seem to worsen through time (Timmer, 2014).

From this perspective one can conceive of the development process as composed of two processes. Labor productivity can arise within individual sectors as the result of technical change, innovation, and capital accumulation. In addition, overall productivity can rise as a result of shifting resources, including labor, from sectors of low productivity to sectors of high productivity. This will raise the overall level of labor productivity in the economy and has been labeled as structural change (Chenery 1960; Kuznets, 1966). It is this process that is the focus of this paper.

The above analysis points to a comparative static gain from structural change. That is, the shift of resources from low to high productivity sectors results in a one-time improvement in the efficiency of production and thus a one-time rise in labor productivity (although this one-time improvement may unfold over decades). However, as Rodrik (2015) has pointed out, there also seems to be a dynamic gain stemming from structural change. That is, once a country has allocated a significant share of resources to the high productivity sector, which he identifies with manufacturing, then this sector's productivity seems to exhibit convergence to levels of productivity similar to those found in already developed countries. This convergence seems to be the result of rapid adoption of newer technologies. It should be pointed out that this seems to occur

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only in the manufacturing sector. This sector would seem to be like a technological escalator in which once one begins simple manufacturing activities then one moves up in terms of technology with rapidly rising productivity.

This seems to represent the process by which economic development first took place in Europe as well as North America. East Asia (Japan, South Korea, and Taiwan) also seems to have followed a similar pattern. That is, economic development and growth are accompanied by a decline in the share of agriculture in GDP and employment, while the share of manufacturing (industry) in GDP and employment rises. Eventually, a second type of structural change also occurs. The share of manufacturing in both GDP and employment tends to decline as the service sector takes on greater importance.

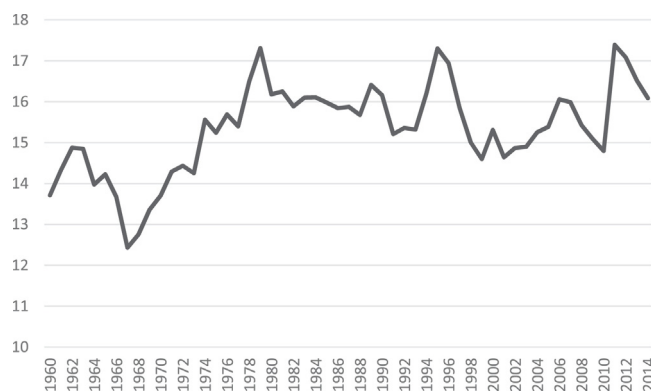
However, recent work by [Rodrik \(2015\)](#), [Felipe et al. \(2014\)](#), and [Amirapu and Subramanian \(2015\)](#) seems to indicate that this path of economic development may be weakening. That is, in the past countries have achieved rapid growth and development by rapidly shifting resources and labor from agriculture where labor productivity is low to manufacturing where it is high and subject to dramatic growth via technological catch-up. However, the recent work mentioned above uses the term premature deindustrialization to characterize more recent experience.

Premature deindustrialization can best be defined by thinking about the relationship between GDP per capita and the share of manufacturing in GDP and employment. Empirical evidence indicates that the relationship resembles an upside down U. As GDP per capita rises, the share of manufacturing in GDP and in total employment rises, reaches a peak, and then declines. The work of [Rodrik \(2015\)](#), [Felipe et al. \(2014\)](#), and [Amirapu and Subramanian \(2015\)](#) seem to support the conclusion that this relationship has been weakening (the upside down U has been shifting downward) and the peak share of manufacturing as a share of GDP and employment has been occurring at lower and lower levels of GDP per capita (the upside down U curve has been shifting to the left).

In addition, many countries have found it difficult even to increase the share of manufacturing in GDP and employment as economic growth has occurred. For example, India has over the last two decades experienced an accelerating rate of growth of GDP and GDP per capita, but manufacturing does not seem to have played a very important role. Data from the World Bank on the share of manufacturing in GDP is presented in [Fig. 1](#) for the time period 1960 to 2014. As one can see, the share rose from the mid-1960s until 1980, but since then has remained stagnant, although subject to fluctuation. Time series data on employment in manufacturing as a share of total employment in India indicates that a pattern similar to that in [Fig. 1](#) characterizes this variable as well. Thus manufacturing does not appear to have played a dynamic role in the Indian growth process. Instead, it is the rapid growth of the service sector which seems to have been important. Not the traditional service sector which is small scale and labor intensive in nature, but the modern service sector which is intensive in the use of both physical and human capital ([Kochhar, Kumar, Rajan, Subramanian, & Tokatlides, 2006](#)). Data on employment in manufacturing in India reveals a similar pattern and will be discussed later in the paper.

One might argue that India is following an alternative development path based upon rapid growth in modern services based on a relative abundance of human capital. The difficulty here is that what India has a relative abundance of is low skilled labor and rapid growth in modern sector services is unlikely to provide the jobs necessary to employ this abundant, unskilled labor which earns its living in agriculture and the informal sector in urban and rural areas. Recent work by [Rodrik \(2015\)](#) indicates that while productivity in the service sector may be higher than in agriculture, it does not seem as high as in manufacturing and the dynamic gain associated with manufacturing does not seem to occur for services. This is further supported by the work of [deVries, Timmer, and deVries \(2015\)](#).

The discussion above is made all the more interesting when one compares the Indian experiences with that of its neighbor, Bangladesh (for years prior to 1971 East Pakistan's data is utilized in constructing the data series for Bangladesh). This country too has experienced a period of rapid economic growth, beginning in the middle of the 1990s, although its growth rate has been below that of India ([Asadullah, Savoia, & Mahmud, 2014](#)) until recently (2016) when GDP per capita growth in Bangladesh exceeded that in India ([World Development Indicators, 2017](#)). However, its experience in terms of manufacturing has been quite different. [Fig. 2](#) illustrates the share of manufacturing in GDP from 1960 to 2015 utilizing data



**Fig. 1.** Manufacturing as a Share of GDP (India).

Source of Data: [World Development Indicators, 2017](#).

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