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Has Liberalization Strengthened the Link between Services and Manufacturing?

By

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Executive Summary

Globalization and pressure from increased competition have led to "splintering" of in-house services from formerly integrated manufacturing firms in developed economies and, at the same time, to an increase in "outsourcing" of these same services. These two trends have caused a stronger linkage in services and manufacturing in economic data because services which were previously lumped with manufacturing are now recorded separately and, in a sense, given identity. The study tries to shed some light on this linkage in the Philippine case. Contrary to experiences of other countries, the contribution of services to growth in manufacturing decreased from the 1980s to the 1990s. The manufacturing sector's usage of services also declined from the first to the second period. This result suggests that the Philippines has caught the "splintering" trend quite late and is, perhaps, only now catching up.

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I: Introduction

In recent years, services have become more and more significant to national economies. Part of this can be understood as going hand in hand with economic development. The theory is that as per capita income grows, the share of agriculture in total gross domestic product declines, manufacturing takes on a larger share of GDP and employment, until, eventually, the services sector takes over as the leading growth sector. A cross-country study conducted by Francois and Reinert (1996) empirically affirmed that the share of services in aggregate output and employment does indeed rise with the level of development.

Besides the growth in significance of services, there also takes place a shift in the industrial structure in many nations. Pilat and Wolfl (2005) document the growing trend towards the outsourcing of business-related services, such as research and development, financing or logistics instead of having these functions done in-house. Manufacturing firms hire specialized service providers or spin off segments of their company to create new firms that can then provide services at lower cost or higher quality. In the process, services have appeared to be more intricately intertwined with manufacturing, having been incorporated into the value chain as both links and individual components. The world over, the service sector's input to manufacturing has become more and more important as manufacturing firms fragment and grow more specialized.

Some economists believe that trade reforms and other shifts in economic policy have played a key role in the observed alteration of the industrial production structure. Liberalization has put pressure on firms to work towards operating at optimum efficiency in light of stronger competition. At the same time, globalization has changed the old picture of manufacturing factories into a globalized network of vertically integrated producers of various intermediate inputs. Liberalization and increased competition have made outsourcing service activities more necessary.

Growth of services' role in the economy is part of the evolutionary pattern of development and is positive. Yet, for developing countries, the strong role of services is faced with some trepidation. Some argue that growth in services alone cannot lead to sustained development. Manufacturing growth, they posit, is necessary, because services depend on manufacturing demand, and without concomitant growth in the latter, growth in services is simply not sustainable. However, with services becoming more and more important to the manufacturing efficiency and productivity, services growth itself can spur manufacturing growth. If this can be shown to empirically hold, it may be suggested that the two-way relationship between services and manufacturing will create a virtuous cycle that will allow both sectors to grow, and allay some fears regarding the sustainability of overall economic growth.

Over the past decade, the services sector in the Philippines has briskly expanded. In fact, it has done so to such an extent that services comprised 50% of the country's GNP and 53% of its GDP, as well as employ 47% of the total labor force, in 2005. In this, the nation's

experience has paralleled those of other countries. The question, though, is whether liberalization in the country has, as it has in other countries, led to the shift in industrial structure as well. What kind of linkage exists between services and manufacturing? Do services contribute significantly as an input to manufacturing in the country? Has the relative contribution of services to the growth in Philippine manufacturing increased as liberalization occurred? These are the questions that this study hopes to shed some light upon.

The rest of the paper is organized as follows: Section 2 provides a review of a few studies that examine the sources of growth and the role of services as an input to manufacturing, as well as studies that deal with observed structural changes in the manufacturing sector. Section 3 presents a sectoral discussion of how manufacturing makes use of specific services as part of its production process and gives a less abstract flavor of actual interaction between the two sectors. Section 4 discusses the methodology of the study, explaining the theory of the KLEMS (capital-labor-energy-materials-services) production function, which separately and explicitly recognizes the contribution of services to production. To complement the result of this growth accounting, an analysis of linkage and spillovers of services based on input-output tables for manufacturing are discussed in Section 5. Results from the examination of the 1985, 1988, 1994 and 2000 I-O tables are presented to assess changes in relative contribution of services to manufacturing. In order to give context to the changes that occurred, regression analysis is employed in Section 6. It examines whether any changes in the usage of services in manufacturing could be connected to liberalization and economic reforms. Section 7 concludes.

II: Services, Economic Growth, and Structural Changes

Productivity studies in the Philippines have always used the traditional two-input framework of analysis, accounting only for labor and capital inputs in the production function. Using this standard model and employing a stochastic frontier production function approach to decompose output growth, Cororaton et al (1995) found that capital inputs showed increasing contribution to output growth in the manufacturing sector, while that of labor diminished. Using a different labor data and a slightly different methodology, Cororaton and Cuenca (2001), meanwhile, noted that while growth in the Philippine economy could generally be attributed to capital accumulation, the same could not be said of the manufacturing sector where capital growth did not *always* yield positive contributions.

In this two-input type of analysis, the role of services is difficult to recognize. Knowing the interplay among output, labor, and capital is not particularly helpful in determining the exact role that services play. To date, the matter has not been closely examined in the Philippine context although it has received attention in other parts of the world.

An Organization for Economic Co-operation and Development (OECD) study by Pilat and Wolfl (2005) focused on the linkage between services and manufacturing in a number of OECD member countries. They found that the value added from the services sector to manufacturing production has been increasing over time and reached up to a quarter of total output in certain OECD nations by the mid-1990s. They also discovered that a growing share of

workers who officially belong to the manufacturing sector are engaged in service-related activities.

For India, Banga and Goldar (2004) studied panel data from three-digit level industries in India over a period of eighteen years in order to estimate a KLEMS (capital-labor-energy-materials-services) production function that would determine the sources of growth in the manufacturing sector. They found that the real value of services purchased by industrial units grew rapidly in the 1990s. In fact, the contribution of services input to manufacturing output increased from one percent in the early eighties to roughly twenty-five percent in the nineties. Industrial productivity was found to have a positive relationship with services input.

Hansda (2001) corroborated this strong relationship between services and manufacturing result in India. The study examined inter-sectoral linkages via the 1994 input-output tables and determined that industry was the most services-intensive sector in the country, with 70% of its activities directly so. It also found that services had the largest inducing effect on the economy, based on backward and forward linkages. Growth impulses in the Indian economy have been found to originate in services vis-à-vis manufacturing (and agriculture).

Bathla (2003), employing a Granger causality test on Indian GDP data from 1950 to 2001, found bidirectional causation between the manufacturing and services sectors. Services, the author maintained, may be stimulated by industrial expansion, but they also have the ability to induce industrial growth. Cointegration tests also find that services may even contribute to improving the linkages between agriculture and manufacturing.

For Korea, Kim and Kim (2000) posited that services liberalization could increase not only productivity in the services sector by technology transfers and economies of scale, but also productivity in other sectors, such as manufacturing, by increasing access to producer services and lowering the cost of inputs. Selecting manufacturing sectors for which output and factor data were available, the authors examined the total factor productivity (TFP) growth rates and the input coefficients of services to the chosen sectors in order to verify their hypothesis. Unfortunately, given that the liberalization in Korea occurred only in the mid-1990s, the results found were not definitive and the authors reported that it may be premature to claim that the liberalization of services has truly positively affected productivity. However, the authors did find evidence of enhanced competition in specific sectors that may, in the future, lead to increased productivity. Nam (1999) found that explicitly including intermediate inputs (which include services), other than capital and labor, in productivity models lead to smaller fluctuations and more consistency in manufacturing TFP growth rates in Korea. This is an indication of the significance of these inputs.

Using the same KLEMS production function for the United States, Strassner et al (2005) found that real demand for services input averaged the highest annual growth of all inputs used in the production of US output. A study conducted on Sub-Saharan Africa, Blunch and Verner (1999) also found significant evidence on the important role of the services sector. In modeling the relationship between agriculture and manufacturing, the authors found that services was present in the co-integrating relationship and was weakly exogenous to the system

in all three economies under consideration, both in the long- and the short-run. The growth of the services sector was found to have dynamic effects on both agriculture and manufacturing. Andersson (2004) likewise found producer services important for manufacturing industries in Sweden.

The above literature almost unanimously shows that, where services are explicitly taken into account in growth accounting, its increased role in economic growth and manufacturing has been evident. The other facet of the relevant literature tackles the structural change in manufacturing and highlights the greater service content of manufactured goods. Many of these papers attempt to correlate such a shift or structural change with trade reforms or liberalization.

For example, Banga and Goldar (2004) argue that the rapid growth of the use of services in manufacturing can be attributed to the trade reforms instituted in India. The growth in services input is corroborated by Gordon and Gupta (2003) who noted, by tracking changes in input-output coefficient, a 40% increase in the use of services sector input to industry from 1979 to 1994. Hansda (2001) also found that the intermediate use of services output has grown from 31.2 percent to 38.5 percent over the period 1968-1994 and that the number of industrial activities with above average services intensity has also been found to increase to 74 percent of industrial activities, while average service intensity has doubled to 30 percent of gross output.

In the United States, over as short a span as 1997 to 2003, services input rose from 22.5 percent of gross output to 25.1. This happened as materials and energy input dropped its share of production (Strassner et al, 2005). The high growth of intermediate inputs has also been noted as a particularly interesting feature of Canadian manufacturing growth (Gu and Ho, 2000).

Francois and Reinert (1996), studying national income data for 15 countries and examining upstream and downstream service linkages, found that the level of development measured by per capita income and the intensity of use of services in manufacturing are positively related. The demand for services as an intermediate input rises as changes take place within manufacturing industries. There is what they term a “fundamental change” in the production structure.

However, not all nations experience the same surge in the significance of services input in manufacturing as a result of policy changes. Ruben (2002), analysing sectoral dependency ratios based on Turkish national input-output tables for the years 1985, 1990 and 1996, found that the total intermediate input sales of the service sector to the manufacturing sector declined.

III: Manufacturing Fragmentation: Sectoral Experiences

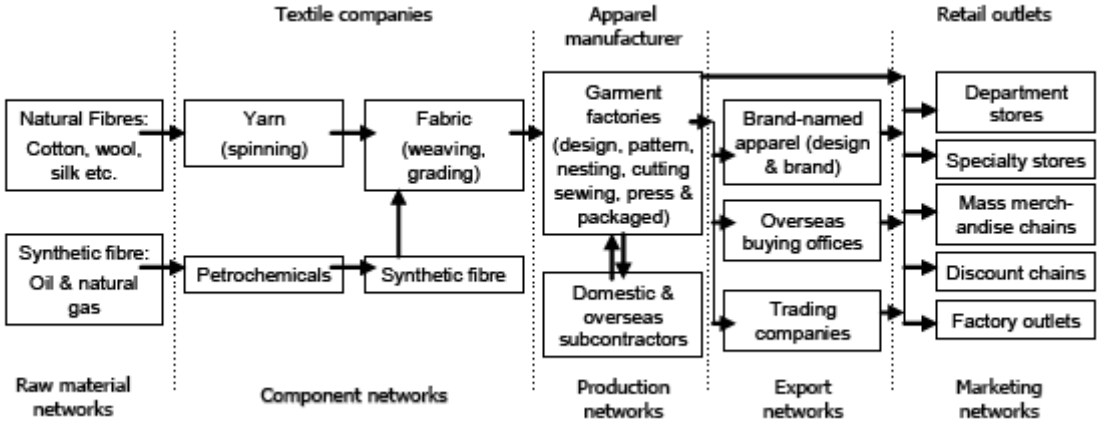
While most of the literature pointing to increased usage of services in manufacturing are based on model result or input-output analysis, Gage and Lesher (2005) provide a more descriptive study of the phenomenon of increasing fragmentation by manufacturing firms and

the role that services play in this process. The study provides explorations of four specific industries, breaking down the value chains of apparel, automobiles, semiconductor chips and wood furniture. We summarize their results as they are particularly illustrative of how services impact the manufacturing sector.

Apparel

Apparel manufacturers view design, marketing and branding – all service components – as the source of competitive advantage, and have proceeded to disaggregate the entire manufacturing process into strategically pertinent components. A company like Benetton may now choose to focus on its core competence of design, cutting, quality inspections and distributions while outsourcing and off shoring the rest of the production activities to more cost-effective firms elsewhere, particularly in Asia. Aside from designing and marketing, an apparel company based in a developed country can oversee the provision of materials and the logistics of how, when and where manufacturing takes place (see Figure 1).

Figure 1. Apparel Value Chain



Source: Gage and Lesher (2005)

This type of fragmentation has been made possible by technology and changes in trade policy. With technology, firms are able to break up the digital aspects of production and turn