Andżelika Kuźnar  
Collegium of World Economy  
Warsaw School of Economics  

Eliza Chilimoniuk-Przeździecka  
Collegium of World Economy  
Warsaw School of Economics

Services in Global Value Chains  
– Emerging Markets’ Perspective

**ABSTRACT**

The sourcing of services to manufacturing processes has recently become an important aspect of the global value chain concept since services have increasingly been embodied in manufactured products. Despite the ever-closer links between the two sectors, unbundling of many processes and sourcing them from overseas providers due to the cost reduction is vital for many firms in order to compete successfully in the global market. In this paper, we explain the nature and size of services contribution to global value chains and identify the most important market players. We argue that the increasing importance of services in manufacturing processes resulted in a widespread global sourcing of business services, especially innovation, which is essential for any business. It leads us to the conclusion that there are emerging economies raising and enhancing their position as service vendors next to the former (western) technology giants.

**Keywords:** value added, global value chains, emerging economies, services, offshoring  
**JEL codes:** F12, F23, O31
Introduction

Services and goods have recently become more linked to each other. Thus, a separate identification of the individual service components, which make up the full value of a product, becomes difficult. However, the WTO and OECD database on trade in value added enables analysing the scope of services embodied in manufacturing processes, i.e. how services contribute inputs to manufacturing at any stage of the production process. The statistics also allow for measurement of services in international trade and capturing their contribution to global value chains (GVCs) more precisely than before. Finally, they are also an important source of information on the contribution of individual countries to the production processes on different stages of a fragmentized value chain. It is of high importance as the world is characterised by an increasingly dispersed production process that makes the geographical identification of value creation more difficult. Emerging markets are increasingly involved in these processes and they play various roles in GVCs. The purpose of the article is to present the dynamics of services in global value chains with a special attention given to emerging economies.

1. The Inter-relationship between Services and Manufacturing

The relative importance of manufacturing and services in economies, and the inter-relationship between the two has been the subject of much discussion. Some researchers argue that the decline of manufacturing share in GDP observed in most economies, accompanied by a simultaneously rising role of services is temporary. They also believe that services are determined critically by manufacturing: without the latter one, the service sector would collapse. This view is based on a widespread assumption that goods and services are completely separate entities, disassociated from each other and being influenced by separate supply and demand forces¹, whereas in fact goods and services are interdependent. The demand for many services cannot be met without prior investment in capital goods. For example, if school buildings were not constructed, the demand for education services could not be met². However,

² Ibidem.
this relationship works the other way round as well: without a demand for education, the need for school buildings would not appear. It means that manufacturing seems to flourish in countries with an efficient and well-developed services sector. Thus, services are not perceived any longer as just following and supporting manufacturing activities\(^3\) – these sectors have become highly interconnected. Moreover, services have increasingly been embodied in manufactured products. Thus, modern manufacturing is an industry *making more than just things*. Mobile phones, laptops, jet engines, cars, etc. are sold not just as specific things (tangible goods). Manufacturing goods contain a vast array of services, e.g. research and development, design, marketing, telecommunications and financial services, maintenance and repair. For example, in the United States, on average, 25.3% of intermediate inputs purchased by manufacturers in 2011 were from the services sector\(^4\).

The increasing “consumption” of services in manufacturing processes, both in terms of production processes and sales, is referred in management literature as the *servitization* of products and business\(^5\). According to A. Neely, servitization involves firms developing the capabilities they need to provide services and solutions that *supplement* their traditional product offerings\(^6\). New business models are based on *manu-services*\(^7\), which constitute a broad group of activities that involve combining advanced manufactured goods with different services\(^8\). They range from relatively simple combinations of goods and complementary services (such as maintenance and installation) to complex integration of manufacturing and services (which may involve providing services such as development, design and after sales care in close integration with the production of a good)\(^9\).


\(^8\) It is not enough, though, for a service activity to be used as an input to the manufacturing process (e.g. transport of produced goods) or for a service company to rely on manufactured goods (e.g. supermarkets selling goods) to classify them as manu-services, as long as services are not directly related to any particular product.

\(^9\) Manu-services share some common characteristics, such as:

– the customer pays a regular fee to rent a good rather than buys it (e.g. leasing cars, providing IT systems);
The attitude based on increasing usage of services in manufacturing processes goes beyond a traditional bipolar division of the economy. Thus, the final value of a product is based on the combination of manufacturing and service inputs used in the production process.

The phenomenon of bundling manufacturing and service processes in the final good affects the way companies perceive themselves: e.g. IBM considers itself primarily a service firm, providing “business solutions”\(^{10}\). Such a shift in strategies is necessary to compete with companies from developing countries (benefiting from lower production costs), as the price elasticity of demand for business solutions is lower than for hardware\(^{11}\). Moreover, bundling services with goods allows for greater customisation and differentiation of firms’ offerings, increasing their chances to earn higher returns (due to premium pricing), spread risk by diversifying the output mix and improve their market position. It also gives an opportunity to move a particular activity up the value chain\(^{12}\). Many companies have relocated low-value processes (such as production and assembly) to overseas locations with lower labour costs, while concentrating on knowledge-intensive activities (the higher end of the value chain such as R&D, or product design).

The reasons for greater servitization are categorized by Sissons\(^{13}\) and can be summarised to: i) changing consumer needs\(^{14}\), ii) changing the nature of value chains\(^{15}\), iii) offshore outsourcing\(^{16}\).

- the manufacturer often bears the risk associated with a product (e.g. a fleet of vehicles maintained at the manufacturer’s risk);
- service contracts that last longer are signed instead of many one-off transactions;
- manufacturers develop relationships with customers (rather than just making transactions with them);

\(^{10}\) As a matter of fact, IBM is able to provide large corporations around the world with anything that is regarded as IT solutions: hardware, software, staffing, connectivity, and the Internet.


\(^{14}\) In knowledge economies demand becomes more sophisticated thus consumers require solutions that best meet their needs. In response, firms improve their offerings, providing the customer an outcome, or solution (often customised) rather than separate goods or services.

\(^{15}\) As value chains become longer, more complex and (often) international, firms need to deal with the problem of coordination of activities along the chains. Manu-services are used to transfer knowledge, information and expertise between entities included in value chains – it allows them to develop better products (thus manu-services are often drivers of innovation).

\(^{16}\) As value chains become longer and more advanced, they also become more dispersed around the world. Firms seek opportunities in order to (i) reduce costs and risks, (ii) acquire inventions; therefore, they increasingly outsource non-core functions.
2. The Role of Services in Global Value Chains

Global value chains is a term used for describing an extension of a concept that goes back to Michael Porter’s view of the economic process as “activities organized as separate but coordinated phases”\textsuperscript{17}. GVCs are focused on the sources of value associated with the operation of the chains, whether such a value accrues to producers, consumers or the economy at large\textsuperscript{18}.

Traditionally, global value chains have been dedicated to manufacturing sectors. However, recently it has been recognized in service sectors as well – services have sometimes been referred to as “the glue that holds supply chains together and ensures that they function in a fluid manner”\textsuperscript{19}.

The figure below (see figure 1) illustrates the role of services in GVCs.

Services can be used as inputs either in manufacturing or services production. In both cases, they can be of domestic or foreign origin. Services used in manufacturing processes fall into the category of manu-services or servitization of manufacturing, as described earlier. Services inputs used in other services production can be called a services network or services value chain.

Firms operating in manufacturing processes and services networks can engage in several forms. There are two most common types: domestic sourcing or services offshoring. The first one can occur either in-house or through outsourcing and can take the form of mode 3 of services supply (commercial presence of a foreign supplier), which is then measured by FAT\textsuperscript{S} statistics. Services offshoring covers two possibilities: outsourcing of service activities to an independent supplier (offshore outsourcing) or in-house service activities conducted by a foreign affiliate (captive offshoring). It results in cross-border trade (mode 1 of services supply in GATS terms) or in other words: trade in tasks, which is covered (at least to some extent) by BOP statistics on services.

There is one more form, which comes only in case of a manufacturing process, i.e. manufacturing services on physical inputs owned by others. It may cover processing, assembly, labelling, packing, and so on. In this situation, a foreign company moves


its physical inputs to the domestic economy, where the manufacturing services are “consumed” (mode 2 – consumption abroad). These are so called “goods for processing” in BOP terminology. 

**Figure 1. The Role of Services in GVCs**

<table>
<thead>
<tr>
<th>Service origin</th>
<th>Manufacturing output</th>
<th>Services content of exports</th>
</tr>
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<tbody>
<tr>
<td>Domestic</td>
<td>Manufacturing services on inputs owned by others – M2 exports (BOP)</td>
<td>Domestic services content of goods exports</td>
</tr>
<tr>
<td></td>
<td>Domestic sourcing (outsourcing or in-house) – M3 imports (FATS)</td>
<td>Domestic services content of goods exports</td>
</tr>
<tr>
<td>Foreign</td>
<td>Services offshoring (outsourcing or FDI) – M1 imports (BOP)</td>
<td>Imported services content of goods exports</td>
</tr>
</tbody>
</table>

**Services output**

| Domestic       | Domestic sourcing (outsourcing or in-house) – M3 imports (FATS) | Domestic services content of services exports |
| Foreign        | Services offshoring (outsourcing or FDI) – M1 imports (BOP) | Imported services content of services exports |

Notes: the diagram shows whether a services input is of domestic or foreign origin, what the respective sourcing strategies in manufacturing and services production are, and how the services input is exported. The sourcing strategies are furthermore associated with modes of supply of services imports and respective statistical frameworks (in italics).

M1, M2, M3 – modes of services supply, as in GATS terminology
FATS – foreign affiliates trade in services
BOP – balance of payments

The export perspective analysis leads to a conclusion that development of manu-services is facilitated by the statistics on trade in value added, which has shed some light on the contribution of domestic and foreign services content in goods and services. Despite the possibilities offered by the statistical systems mentioned above, it is still a challenge to value accurately the share of services in production and international trade. This is especially the case when services are provided in-house. In such case, services such as product design, engineering services, research and development, advertising, or bookkeeping supplied by manufacturing companies, are typically

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20 What is interesting, since the 6th edition of Balance of Payments Manual these transactions have been recorded as services trade, while before they were recorded as goods trade; *Balance of Payments and International Investment Position Manual (BPM6)*, International Monetary Fund (IMF) 2009.
counted as goods. It understates the true contribution of services and results in an under-appreciation of the service contribution to the product’s final value\(^{21}\).

### 3. Services as Components of Manufacturing Products

Despite the fact that the phenomenon of servitization is recently widely known, it is very difficult to identify individual service components that make up the final value of a product. There have been several attempts to investigate this issue. For example, Ali-Yrkkö et al.\(^{22}\) conducted a study of Nokia N95 to find out what exactly constitutes its value. The researchers argued that the value of the physical components (including a CPU, memory, integrated circuits and a camera) accounted for approximately 33% of the phone, and its assembly – 2%. The remaining two-thirds were divided between Nokia’s internal support services (31%), licenses (4%), distribution (4%), sales (11%) and operating profit (16%). Still, some of the services that were involved in the production process were not detected in this case. Linden et al.\(^{23}\) estimated that distribution and retail services constitute about 25% of the value of an iPod (at $299 retail price). Another evidence, given by Elms and Low\(^{24}\), assigns 81% of a jacket value ($425 retail price) to intangible assets, and only 9% of this initial price is associated with making the jacket (including the costs of labour and materials). Intangibles in this case consist mainly of services (retail, logistics, and banking), intellectual property, the brand’s value and profits.

OECD statistics based on input-output tables reveal the contribution of services value added needed to satisfy the final demand for manufactured products. This indicator measures to which extent services are embodied in manufacturing processes, i.e. the extent to which services contribute inputs to manufacturing at any stage of the production process. In the mid-1990s, services accounted directly or indirectly for about 22% of manufacturing production on average in OECD economies for which data were available\(^{25}\). In many cases the share has doubled since the 1970s.

\(^{21}\) P. Low, *Services and Value...*, op.cit.


In the mid-2000s this share varied between less than 10% (Ireland) and over 30% (the United States)\textsuperscript{26}.

The relationship between the two sectors is also clearly visible in a relatively new WTO-OECD Trade in Value Added (TiVA) database. The data shows that the contribution of domestic and foreign value added derived from services embodied in the exports of manufactured goods in 2011 reached on average 34.8%, and ranged from 13.7% (in Saudi Arabia, whose export structure is focused on natural resources) to 58.3% (in Hong Kong, which is a world financial and trade centre). In the EU-28 this ratio was about 40%, while it was much less in NAFTA states – 32.6% (see figure 2).

**Figure 2. Services Value Added Content of Manufacturing Gross Exports in Selected Regions and Countries in 1995 and 2011, in %**

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Services Value Added Content of Manufacturing Gross Exports in Selected Regions and Countries in 1995 and 2011, in %}
\end{figure}

Notes: ASEAN: Brunei Darussalam, Indonesia, Cambodia, Malaysia, the Philippines, Singapore, Thailand, Vietnam.
NAFTA: Canada, Mexico, the United States

The data for India and China indicates lower than the world average (34.8%) engagement of services in manufacturing exports, i.e. 33.8% and 31.1%, respectively. Other Asian countries, members of ASEAN, also show relatively low (comparing to the world average) share of services value added in manufacturing exports. Some developing economies have experienced a fall in this indicator (see figure 2: the

\textsuperscript{26} STAN Input-Output Database, OECD, May 2011, \texttt{http://dx.doi.org/10.1787/888932487628} (August 20, 2015).
example of China, ASEAN). It is contrary to the developed countries where we noticed a significant increase in the services share between 1995 and 2011 (see figure 2: the example of EU-28 and Hong Kong). It is also worth indicating that EU-28, NAFTA, India and Hong Kong add more domestic than foreign services value to manufacturing exports. However, in all of them, but also in ASEAN countries, the share of foreign services value in manufacturing exports compared to domestic services value has increased since 1995. India has experienced a particularly sharp increase in the foreign services share, which might indicate rising linkages of this country within global value chains. The opposite trend is observed in China, where it is the domestic services content that rose (from 7.4% in 1995 to 13.3% in 2011).

This trend can prove a favourable development of so far underdeveloped services sector in China on the basis of domestic endowments (knowledge contribution). It is also indicated in the patent statistics, where the share of patents owned by foreign residents in China slightly increased since 1999 only in the group of patents applications to the USPTO (from 58.7% in 1999 to 73.5% in 2011). In terms of applications to the EPO and filed under the PCT – the contribution of foreign entities has been decreasing. On the other hand, the share of foreign residents in India recorded a significant growth since 2002 regardless the application office (see figure 3).

**Figure 3. Patents Owned by Foreign Residents by Patent Offices and Triadic Patent Families Applied for by Chinese and Indian Residents**

4. Offshoring of Innovation

Outsourcing and offshoring of manufacturing have become a common practice especially for mass-produced labour-intensive work: from the mid-1970s to mid-1990s American companies doubled the share of imported inputs for all manufacturing. Transferring production to other countries due to labour cost arbitrage – relatively less expensive labour force in emerging economies – was a very effective strategy to achieve a (cost based) competitive advantage. However, the unbundling of business processes has extended this practice from manufacturing to most business services and functions, including high value adding activities, such as engineering design, new product development and research and development (R&D). Service activities that are the object of offshore demand, namely “other commercial services,” have become more important than the traditional “travel” and “transport” components of world services trade, and are now the fastest growing segment of world trade overall. Advances in ICT have enabled companies to disaggregate, modularize and source business administrative and technical work from third party providers any place in the world.

The range of business services that are being offshored has widened over the last two decades, and moved from simple, routinized tasks, such as call centres and standard IT support, to offshoring of high value adding processes. International sourcing of routinized business services (service contribution to manufacturing or

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29 Although the outsourcing of business services and functions may have had its beginning with the founding of ADP (Automatic Data Processing) in 1949, the offshoring of business services and functions began to take off in the early 1980s, when India based providers who performed business services for major US companies on site, showed that same work could be performed offshore, enabled by advances in ICT. The General Electric (GE) decision in 1997 to set up its captive centre GECIS (General Electric Capital International Service) in Bangalore served to legitimize the practice and signal the opportunities for enormous savings and the execution of administrative functions. GE also led the way in monetizing captive operations offshore by spinning off GECIS, which became GENPACK in 2005. GENPACK has grown to become a global company operating in 24 countries, employing more than 62 thousand people speaking 30 languages, and providing ITO (IT Outsourcing) and BPO (Business Process Outsourcing) services, financial risk management, supply chain, procurement, enterprise application services, analytics and research. A.Y. Lewin, C. Peeters, Offshoring Work: Business Hype or the Onset of Fundamental Transformation?, "Long Range Planning" 2006, no. 39, pp. 221–239; A.Y. Lewin, S. Massini, C. Peeters, Why Are Companies Offshoring Innovation? The Emerging Global Race for Talent,"Journal of International Business Studies" 2009, vol. 40, no. 6, pp. 901–925.
service production) and functions reached a global turnover of $952 billion in 2013\textsuperscript{30}, with IT accounting for $648 billion and BPO for $304 billion.

Although most of the attention on offshoring at the turn of the millennium was about ITO and BPO, offshoring of inventions\textsuperscript{31} was developing and growing at the same time, and accounted for $1.54 trillion in 2013\textsuperscript{32}.

The first R&D captive centres by western multinational corporations (MNCs) in low cost countries were established in the mid-1960s. Kuemmerle\textsuperscript{33} estimated that 6.2% of R&D processes in MNCs were carried out offshore in 1965, and 25.8% in 1995. It is noteworthy that between 2004 and 2007 MNCs increased their total number of R&D locations by 6%, of which 83% were set up in China and India\textsuperscript{34}. Recent data on global innovation expenditures reaffirms a general upward trend. The business R&D intensity (the share of R&D expenditure in GDP) in the US reached 0.63% in 1953 and it increased to 2.8% in 2011\textsuperscript{35}. The biggest contributors to recent growth have mainly been business services such as telecommunications and IT, R&D, and financial services.

The UNCTAD\textsuperscript{36} report anticipated that emerging economies would be adopting and executing policies to develop the capacity of their economies to conduct innovation related activities by investing in programs that upgrade and increase the supply of highly skilled labour in science and engineering (STEM)\textsuperscript{37}. Collectively emerging economies were expected to increase their participation in the internationalization of R&D on a larger scale. The United States and Canada, which still account for the highest share of R&D, experienced a decrease in their share of global R&D from 38% in 1999 to 30% in 2011 (however, the US is still the largest single R&D-performing country). The European Union accounted for 22% total global R&D in 2011. During


\textsuperscript{31} In the traditional sense an invention is synonymous to innovation. But there are differences between these two terms. Inventions can be defined as the creation of a product or introduction of a process for the first time. Inventions generate new ideas, patents, prototypes, designs, breakthrough experiments, and working models. Innovation occurs if someone implements an invented product, process or service to the market, meaning that innovation transforms inventions into commercial products, services, and businesses.


\textsuperscript{34} G. Gereffi, K. Fernandez-Star, The Offshore Services Global Value Chain, Duke University 2010.

\textsuperscript{35} Science and Engineering Indicators, annual reports, National Science Foundation.


\textsuperscript{37} STEM – Science, Technology Engineering and Mathematics; in sciences: life sciences (except medical sciences), physical sciences, mathematics and statistics, computing, and engineering.
this time, Asian countries’ (including China, India, Japan, Malaysia, Singapore, South Korea, and Taiwan) share of global R&D increased from 24% in 1999 to 34% in 2011 – China (15%) and Japan (10%) were the largest R&D performers in this group (Science and Engineering Indicators 2014). The pace of real growth over the past 10 years in China’s overall R&D expenditures has remained exceptionally high at about 18% annually (adjusted for inflation).

Although in the US MNCs run the largest number of R&D centres globally (227 in 2013), India and China, consistent with national aspiration of economic development, have become attractive locations for fully owned R&D captive centres and R&D service providers. For example, NASSCOM\textsuperscript{38} estimates that in 2011 over 400 ER&D (Engineering, Research and Development) service providers in India had a total revenue of $9.5 billion and employed 180 thousand scientists and engineers\textsuperscript{39}. According to the OECD\textsuperscript{40}, China doubled the value of business expenditure on R&D (BERD) between 2007 and 2011, the Slovak Republic – increased it by 187% and South Korea – by 147%. In contrast, developed economies such as Germany and the US increased the value of BERD only by 109% and 104%, respectively (see figure 4).

\textbf{Figure 4. Trends in Business Enterprise Expenditure on R&D, 2004–11 (index 2007=100)}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4.png}
\caption{Trends in Business Enterprise Expenditure on R&D, 2004–11 (index 2007=100)}
\end{figure}

Source: Main Science and Technology Indicators Database, OECD, June 2012.

\textsuperscript{38} NASSCOM (The National Association of Software and Services Companies) – a trade association of the Indian information technology and business process outsourcing industry.

\textsuperscript{39} India IT-BPM Overview, NASSCOM n.d, \textlesshttp://www.nasscom.in/indian-itbpo-industry\textgreater (December 25, 2013).

\textsuperscript{40} Main Science and Technology Indicators Database, OECD 2012, \textlessdoi: 10.1787/data-00182-en\textgreater (January 15, 2014).
Concluding Remarks

One of the features of today’s world is the rising interdependence of services and manufacturing and emergence of so called manu-services, providing consumers with exceptional offerings and enabling effective coordination of activities along complex and geographically dispersed global value chains. At the same time, sourcing of services to manufacturing processes has become an important aspect of the global value chain concept. Advances in ICT enhance the unbundling of business processes. Thus, companies numerous disaggregate, modularize and source business administrative and technical work from third party providers in any place in the world. Global sourcing moved from back office activities, low skilled and standardized tasks, such as call centres and some IT support services, to more strategic and value adding activities, such as R&D, new product development and engineering design. It has become a strategic tool for maintaining competitive advantage, and particularly valuable to companies struggling with a lack of innovation due to a shortage of STEM talents in the home country and high costs of gaining new technologies. Because of that emerging economies, especially China and India, as low-cost providers of skilled labour have risen and enhanced their position as service vendors next to the former technology giants.

References


27. *Science and Engineering Indicators*, annual reports, National Science Foundation.


