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# Global Value Chains: Economic And Policy Issues

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## 1. Introduction

“Companies no longer compete – Value Chains Compete” (Murphy, 2007, p.11)

In the past few years, a fairly substantial literature has emerged addressing the phenomenon of global value chains (GVCs). While one can find various definitions of GVCs, the simple concept proposed by Lunati (2007) seems to capture the spirit of most definitions. Namely, GVCs are international supply chains characterized by fragmentation of production activities across sites and borders. In effect, the whole process of production, from acquiring raw materials to producing and delivering a finished product, has increasingly been “sliced”, so that each activity that adds value to the production process can be carried out wherever the necessary skills and materials are available at competitive cost (OECD, 2007; Feenstra, 1998). A related explanation of the GVC phenomenon is provided by Borga and Zeile (2004) who characterize the GVC phenomenon as the increasing divisibility of production activities. That is, production activities can be increasingly divided into different stages that can be performed in different locations.

The GVC phenomenon has, in turn, been linked to the concept of international outsourcing (“offshore outsourcing”), although they are conceptually distinct. In the vertically integrated firm, the production process is divided into separate stages with different units of the firm specializing in particular stages of production. The two phenomena are linked, since there is a perception that value chain activities that are sited overseas are increasingly being carried out by independently owned companies, rather than by affiliates linked by ownership to the companies doing the contracting-out.<sup>1</sup> Coombs, *et al.* (2003), among others, argue that products are nowadays provided to the market through iterative sequences and complex interactions among a variety of agents. The modern corporate model involves firms focusing on “core competencies” with greater specialization combined with strategic sourcing and partnering.

The claim that global value chain activities are increasingly being carried out by independently owned firms rather than by overseas’ affiliates of the outsourcing

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<sup>1</sup> Antras (2005) links the GVC and off-shoring phenomena as related strategic decisions in noting that in developing their global sourcing strategies, firms not only decide where to locate the different stages of the value chain, but also the extent of control they want to exert over those processes.

(multinational) firm distinguishes offshore outsourcing from either simply “off-shoring” or “outsourcing”. Hence, the modern corporate model is increasingly viewed as being “networked-based” with growing international specialization and focus on “core competencies” combined with strategic sourcing and partnering involving independently owned companies (Cusmano, Mancasi and Morrison, 2008; Manning, Massini and Lewin, 2008).

Neither the international specialization of specific value chain activities, nor offshore outsourcing, are new developments, although the speed and scale of offshore outsourcing activities are suggested to be increasing (OECD, 2007).<sup>2</sup> With respect to the geographical relocation of value chain activities, what is argued to be different about recent experience is that international trade is becoming increasingly concentrated in intermediate inputs rather than finished products (Antras, 2005; Krywulak and Kukushkin, 2009). Furthermore, while first identified for manufactured products, the phenomenon of greater value chain specialization and trade in intermediate inputs is also noted to be occurring increasingly in services, along with offshore outsourcing of services (Markusen and Strand, 2006).

There is also a view that *every* stage of an organization’s value chain is increasingly capable of being relocated anywhere in the world based on where it can be performed most efficiently. The relocation of research and development (R&D), product design and other innovation-related activities has been particularly noted in the recent literature.<sup>3</sup> With modern communications and efficient transportation networks, the various stages can be linked to each other in a relatively smooth manner spanning increasingly greater physical distances (Sydor, 2007). The rise of China as a major site for outsourced manufacturing value-added activities and of India as a site for outsourced service-related activities have been intensively discussed in this regard (Trefler, 2005).

### ***1.1 Focus of Report and Research Issues Addressed***

The broad purpose of this paper is to synthesize and critically evaluate the literature concerned with both GVCs and offshore outsourcing and the factors contributing to the growth of these phenomena. A particular goal is to assess whether the phenomena are capable of being understood by existing theories of international production. If not, what is incompletely or unsatisfactorily explained by existing theories of international production? A related goal is to identify and evaluate whether conclusions regarding the economic gains from international production and trade, including trade among affiliates of multinational companies (MNCs), need to be modified or reversed when applied to trade in intermediate inputs accomplished through offshore outsourcing. The “conventional” view amongst most economists and international business scholars is that increased specialization of production across countries leads to higher real income levels for those countries participating in global economic integration. Is this view still appropriate?

This conventional view has been subjected to questioning in recent years. In assessing whether the conventional wisdom regarding the economic benefits of international

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<sup>2</sup> Indeed, Mankiw and Swagel (2006, p.10) assert with respect to imports related to GVCs and offshore outsourcing: “Whether things of value, whether imports from abroad, come over the Internet or come on ships, the basic economic forces are the same.”

<sup>3</sup> See, for example, Lewin, Massini and Peeters (2009), Manning, Massini and Lewin (2008), Asakawa and Som (2008), Sydor (2007) and Ojah and Monplaisir (2003).

specialization of production still seems appropriate in light of the GVC phenomenon, the paper will consider whether the “drivers” of GVCs and offshore outsourcing are fundamentally different from the traditional determinants of international production and trade patterns. As a related issue, the report will identify and evaluate recent policy recommendations that have been made to enhance the “home country” economic benefits of GVCs and offshore outsourcing. In particular, we will consider whether recent recommendations differ substantively from those made in the past with respect to increasing the net economic benefits of international trade and foreign direct investment (FDI).

### ***1.2 Outline of Report***

The paper proceeds as follows. Section 2 contains a relatively condensed statistical overview of recent changes in international trade involving intermediate inputs, including service inputs, as well as offshore outsourcing. The focus of this section is both on the absolute growth of these activities, as well as growth relative to global international trade flows. Among other things, attention will be paid to whether and to what extent activities traditionally carried out at corporate headquarters, particularly research and development, are being partly or wholly relocated geographically, as well as the extent to which the international relocation is accompanied by outsourcing.<sup>4</sup> Section 2 will also address whether and how recent Canadian experience with trade in intermediate inputs and offshore outsourcing differs from that of other OECD countries.

Section 3 presents an overview of conventional theories of international production, particularly the determinants of the international specialization of production encompassing the allocation of value chain activities across firms, i.e. make-or-buy decisions. Section 4 provides an evaluation of whether and how conventional theories of international production need to be modified or extended in order to explain in a satisfactory manner the phenomena of increased trade in intermediate inputs (including services) and offshore outsourcing. This evaluation includes a consideration of whether new drivers of international trade and outsourcing have emerged in recent years. Relevant theoretical contributions to the literature on international production will be reviewed, as well as empirical studies identifying the main determinants of international production specialization and trade. Recent theoretical and empirical studies of offshore outsourcing will also be reviewed and assessed.

Section 5 will identify and assess policy recommendations that have been made to enhance the home country economic benefits derived from the GVC and offshore outsourcing phenomena. Section 6 provides a brief summary and conclusions.

## **2. The Growth of GVCs and Offshore Outsourcing**

There is no consistent time series evidence on the extent to which trade in intermediate inputs has changed over time. Nor is there consistent evidence on the magnitude of offshore outsourcing activities over time. Furthermore, the evidence that is available is largely based on surveys that are specific to particular time periods and/or locations.

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<sup>4</sup> As Markusen (2005) notes, the loss of domestic service jobs associated with corporate head offices are among the biggest concerns in the trade policy area, so a particular focus on vertical specialization and offshore outsourcing of traditional headquarters’ services seems appropriate.

### 2.1 Imports of Intermediate Inputs

The available information, albeit fragmented, is consistent in documenting the growth of imported intermediate inputs in total domestic production. One frequently cited source is Feenstra and Hanson (1997) who report that imported inputs increased from 5.7% of total U.S. intermediate goods purchases in 1972 to 8.6% in 1979 and to 13.9% in 1990.

Table 1 reports similar data for all manufacturing industries for comparable years for the United States, Canada, Japan and the United Kingdom. Specifically, it reports the share of imported to total intermediate inputs for each country in each sample year (Feenstra, 1998). For the two large economies (U.S. and Japan), the share of imported inputs in total inputs is smaller than for the two smaller economies (Canada and the U.K.). This might be expected to the extent that smaller economies will be driven to specialize in a narrower range of products than larger economies in order to realize attainable product-level economies of scale.

**Table 1: Share of Imported to Total Intermediate Inputs**

(All Manufacturing Industries – percent)

Country	1974	1984	1993
Canada	15.9	14.4	20.2
Japan	8.2	7.3	4.1
U.K.	13.4	19.0	21.6
U.S.	4.1	6.2	8.2

Source: Feenstra (1998)

Table 2 reports shares of imported total intermediate inputs for specific manufacturing industries for 1974, 1984 and 1993. What is interesting to note here is that the growing importance of imported intermediate inputs as a share of total intermediate inputs varies across manufacturing industries. For example, growth is more marked in the case of transportation equipment than it is in the case of chemicals and allied products. While no explanations are offered for the observed differences across industries, it is not surprising to find that GVCs seem most developed in the transportation equipment industry given the high degree of intra-industry trade within the motor vehicle and parts industries.

**Table 2: Share of Imported to Total Intermediate Inputs**

Various Industries (Percent)

<b>Chemicals</b>	<b>1974</b>	<b>1984</b>	<b>1993</b>
Canada	9.0	8.8	15.1
Japan	5.2	4.8	2.6
U.K.	13.1	20.6	22.5
U.S.	3.0	4.5	6.3
<b>Industrial Machinery</b>			
Canada	17.7	21.9	26.6
Japan	2.1	1.9	1.8
U.K.	16.1	24.9	31.3
U.S.	4.1	7.2	11.0
<b>Electrical Equipment</b>			
Canada	13.2	17.1	30.9
Japan	3.1	3.4	2.9
U.K.	14.9	23.6	34.6
U.S.	4.5	6.7	11.6
<b>Transportation Equipment</b>			
Canada	29.1	37.0	49.7
Japan	1.8	2.4	2.8
U.K.	14.3	25.0	32.2
U.S.	6.4	10.7	15.7

Source: Feenstra (1998)

In a more recent contribution, Feenstra and Jensen (2009) discuss measurement and technical problems with previous estimates of materials offshoring, i.e., imported intermediate inputs. In particular, previous studies make the assumption that an industry's imports of each input, relative to total demand for that input is identical to economy-wide imports relative to total demand for that input. To address the potential shortcoming arising from this assumption, Feenstra and Jensen link production and import data to construct firm-level input-output tables and then aggregate these data to the industry level in order to derive imported input intensities by industry for the United States. They compare estimates using the original Feenstra-Hanson calculations to their revised calculations for selected years from 1980-2006. In fact, for most manufacturing industries, the results are similar regardless of how materials offshoring is measured. Across their sample of manufacturing industries, imported intermediate inputs as a share of total intermediate inputs increased by a factor of 200 percent to 300 percent when comparing 1980 to 2006.

Trefler (2005) provides an estimate of offshoring of services for the Canadian economy overall. He uses balance of payments data for services trade for 2004 and focuses on “computer and information services” and “other business services” as being most likely to include services such as those provided by white collar workers in India to customers in Canada. These two categories together account for \$20.4 billion in exports and \$18.1 billion in imports. Trefler then compares these amounts to Canada’s trade in goods. The latter dwarf the former. For example, Canada’s 2004 goods exports were \$430 billion compared to the approximately \$20 billion in exports for the two service categories; however, he argues that a more meaningful comparison would be to the portion of goods’ exports that represents value added created in Canada. In this case, the relevant goods export measure equals \$143 billion. Trefler’s interpretation is that Canada’s trade in white collar-type services is small but not inconsequential.<sup>5</sup>

A number of other studies also report evidence identifying the increased trade in intermediate inputs. For example, estimates by Campa and Goldberg (1997) based on input-output tables show large increases over the period 1974-1995 in the share of imported intermediate inputs in manufacturing industry output for the U.S., Canada and the U.K. In contrast, the share for Japan was found to decrease. Hummels, Ishii and Yi (2001) estimate shares of imported intermediate inputs embodied in a country’s exports. Their calculations from input-output tables reveal that vertical trade as a share of total exports increased for most of the major OECD countries between 1970 and 1990 by up to 25 percent to 33 percent.

Finally, the Conference Board of Canada (2008) divides North American goods trade into three stages- primary, partly finished inputs and finished goods- in terms of where they enter into other regions’ supply chains. It finds that the share of trade in inputs increased dramatically over the 1990s but fell over the period 2000-2003. It then increased to finish slightly higher (at around 30%) in 2006 compared to its value in 2003. The Conference Board concludes that the integration of goods production in North America basically stalled in the post-2000 period; however, it also concludes that Canada has become more integrated, especially in recent years, into the supply chains of other regions of the world, albeit starting from a low base. In particular, Canadian firms are rapidly integrating Asian inputs into their production networks; however, they are not tapping into Asian supply chains as suppliers. Hence, the overall amounts of integrated trade for Canada outside of North America remain modest.

In short, the available evidence (summarized in Figure 1) suggests that developed countries, including Canada but possibly excluding Japan, are using intermediate inputs more intensively in domestic production; however, this should not be seen as direct evidence of increased international vertical specialization of production, nor of increased offshore outsourcing. Specifically, it is not direct evidence of increased specialization of production along the value chain, since imported inputs might simply be displacing domestically produced inputs within the same value chain activities.<sup>6</sup> It is not direct evidence of increased offshore outsourcing, since the estimates discussed above do not distinguish “arms-length” imports from intra-firm imports. Finally, from a Canadian perspective, it is worthy of notice that the integration of North American production in

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<sup>5</sup> Additional data on outsourcing by Canadian firms is provided in Goldfarb (2004).

<sup>6</sup> In this regard, however, Borja and Zeile (2004) provide evidence that intra-firm trade in intermediate inputs is particularly marked in industries characterized by divisibility of the production process. This suggests that the U.S. MNCs involved in their sample are increasingly engaged in vertical specialization.

terms of bilateral trade in intermediate inputs seems to have slowed in the post-2000 period compared to the 1990s, while integration with fast-growing Asian economies seems primarily to involve Canada imported inputs from China while selling raw materials to China.

**Figure 1. Summary of Empirical Evidence on GVCs**

Author(s)	Region	Time Period	Conclusions
Feenstra & Hanson (1997)	U.S.	1972, 1979, 1990	Imported inputs as a share of intermediate goods imports more than doubles
Campa and Goldberg (1997)	U.S., Japan, Canada, U.K.	1974	Increase in imported inputs as a share of mfg. output for Canada, U.S. & U.K.
Feenstra (1998)	U.S., Japan, Canada, U.K.	1974, 1984, 1993	Importance of GVCs varies across countries and industries. Canada is more integrated compared to others
Hummels, Ishii & Yi (2001)	Major OECD countries	1970	Imported inputs as a share of total exports increased by about 30% for most countries
Conference Board (2008)	North America	1990	North American GVCs expanded in 1990s and then expansion stalled
Feenstra & Jensen	U.S.	1980-2006 various years	Imported intermediate inputs as a share of total inputs more than doubled

**2.2 Relocation of R&D Activities**

There is a limited amount of evidence available on the relocation of R&D activities, and most of it is fragmentary based upon surveys carried out at specific points in time. Cantwell (1995) shows that in the 1930s, the largest European and U.S. firms carried out only about 7 percent of their total R&D at locations abroad; however, this figure has steadily risen since the 1960s. Kuemmerle (1999) shows that in 1965 the 32 MNCs studied in his paper carried out 6.2% of their R&D efforts outside the home country boundaries, whereas in 1995, the corresponding figure was 25.8 percent. Asakawa and Som (2008) discuss the growing number of Western and Japanese firms that have been launching R&D operations in China and India. Other surveys provide essentially similar information.

In a recent survey overview, Huggins, Deminbag and Iankova (2007) discuss how R&D strategies and international location decisions have changed substantially in the direction of greater decentralization and cross-border knowledge interdependence. The extent of this process is evidenced by MNEs across all industry sectors allocating an increasing proportion of their R&D abroad. The authors claim that of those products that move in international commerce, R&D-intensive goods are the fastest growing segment.

The authors draw on a database of all announced and realized R&D investment projects undertaken by MNEs between 2002 and 2005. They found that in both Europe and, especially in North America, there was a substantial increase in R&D undertaken outside the home country relative to home country R&D as carried out by MNCs. In general, FDI-related R&D has been centered in a number of key locations in India and China. The key sectors for R&D FDI by total investment are IT and software, semiconductors and pharmaceuticals.

Dunning and Landon (2009) also highlight the increasing importance of external knowledge sourcing by noting that in 2003, the ratio of contract research to in-house R&D was 5.6% for all U.S. industries, whereas it was only 3.7% in 1993. It should be noted that contract research can include research undertaken by domestic firms, as well as foreign-based firms. Hence, it is possible that a substantial portion of the increase in contract research identified does not involve offshore outsourcing. Indeed, Dunning and Landon summarize the results of several recent surveys indicating that the internationalization of innovative activities by multinational enterprises has lagged behind their internationalization of production activities.

Bardhan and Jaffe (2005) discuss some original evidence indicating that there has been a limited amount of offshore outsourcing of R&D to date. As well, offshore outsourcing has been focused on a specific type of R&D. Specifically, from a survey of approximately 50 California-based high-technology firms, they found that domestic outsourcing was the largest and most common form of outsourcing resorted to by reporting firms. Furthermore, outsourced R&D was primarily undertaken by the reporting firms' foreign affiliates. Interviews suggested that relatively routine development activity was subcontracted to arms-length parties, while more "sensitive R&D was carried out by the firm's foreign affiliates. A supporting observation is that reporting firms preferred to carry out "drastic" innovations embodying substantial improvements in existing products and processes within the firm, while R&D involving marginal improvements are candidates for outsourcing.

Additional evidence suggesting differences in the nature of the R&D being undertaken influence the likelihood of the R&D being outsourced is reported by Cohen, Di Minin, Motayama and Palmberg (2009). Specifically, they focus on the separation of "important" R&D from "routine" R&D in the wireless telecommunications and automobile industries and find that important R&D exhibits a strikingly strong "home bias." Their analysis is based upon a classification of patents into "essential" and "unessential" categories for the two industries. They define important and unimportant R&D based upon whether the R&D is associated with essential or inessential patents, and they then compare the location of the inventive teams behind essential and non-essential R&D. In spirit, this finding is similar to the one reported by Asakawa and Som (2008) who discuss the growing number of Western and Japanese firms that have been launching R&D operations in China and India. They note that firms tend to locate more technologically advanced R&D tasks in developed countries which are more likely to provide infrastructure necessary to conduct state-of-the-art research.

In summary, there is certainly evidence of R&D activities being relocated to foreign locations, although there is relatively little evidence on how much offshored R&D is being done by affiliates of the outsourcing firms versus being done by independently owned firms. The available evidence is fairly persuasive that outsourced R&D tends to be of a more routine and less important nature than the R&D performed in the home country.

As noted above, while the offshoring of R&D activities has been seen by some as a challenge to traditional models of international production, that contention will be



reviewed in more detail in a later section of this report. It is merely noted at this point that the distinction between routine and non-routine R&D, insofar as outsourcing activity is concerned is a potentially important one in assessing whether the growth of R&D outsourcing is a challenge to conventional theory regarding international production.

### **3. International Specialization of Production**

In the international business literature, the so-called eclectic paradigm of international production is the underlying conceptual model explaining patterns of international specialization, as well as whether multinational firms exploit firm-specific advantages directly, by producing the input in question, or whether production is “contracted-out” to a third party (Dunning 1973, 1988 and 2001). Specifically, the eclectic paradigm addresses two broad issues related to patterns of international production: 1. where should any specific production activity be carried out? 2. which specific firm(s) should carry out the activity? The second point is related to the issue of whether multinational firms should “internalize” specific production activities or whether they should outsource the activities to independently owned firms.

These two broad issues are obviously directly relevant to the GVC and offshore outsourcing phenomena. The GVC phenomenon encompasses the issue of why increasingly narrowly defined value-chain activities (i.e. production of intermediate inputs) are being carried out in different international locations. The offshore outsourcing phenomenon is essentially concerned with the issue of why MNCs are increasingly choosing to contract-out specific value chain activities to independently owned firms located in foreign locations, rather than having those activities carried out by their own affiliates in the relevant foreign locations.

#### ***3.1 Location-Specific Advantages***

The eclectic paradigm embodies the straightforward presumption that any value-chain activity should be located geographically where it is most efficiently carried-out. Locations have a variety of attributes that make them more or less efficient sites for specific value-chain activities. International competition will, in turn, ensure that firms indeed locate activities in those sites where they are most efficiently carried out.

Traditional international trade theory identifies potential determinants of the advantage that particular locations have with respect to specific production activities. Specifically, in traditional international trade models of the Heckscher-Ohlin (H-O) variety, a country (or region) will enjoy a location (or comparative) advantage in those activities that utilize intensively factors of production that are relatively abundant in the specific country (region), and are therefore relatively inexpensive compared to other countries (regions). The extension of the H-O model to the production of intermediate inputs would suggest straightforwardly that any intermediate input will be produced in locations enjoying a comparative advantage in the relevant production activity.

Indeed, several economists have asserted that the GVC phenomenon is completely consistent with the H-O model, where products are narrowly defined intermediate inputs rather than final goods. For example, Markusen and Venables (2007) posit that fragmentation of the production function allows a country to import just that part of a final good in which it does not enjoy a comparative advantage, instead of importing the whole good; however, no claim has been made that the GVC phenomenon is completely consistent with the H-O model. In this regard, Markusen (2005) highlights the fact that

there is no one “grand model” which includes all possible bases for international trade or for partial or complete international specialization of production.

Markusen distinguishes specifically between comparative advantage theories of trade and non-comparative advantage theories of trade. The former encompass Ricardian and H-O determinants of trade. Ricardian models emphasize differences in technologies as determining the volume and direction of international trade flows. H-O models, as noted above, emphasize differences in factor intensities across production activities, along with differences in technologies as determinants of location advantage. Non-comparative advantage (or industrial organization) theories of trade highlight scale economies, imperfect competition and product differentiation as motivators of international trade.

### ***3.2 Imperfect Competition and Other Influences on Trade***

The distinction between comparative advantage as the basis for international trade versus scale economies, imperfect competition and/or product differentiation as the basis for trade corresponds, in part, to the distinction in the international business literature between location-specific advantages and firm-specific advantages. The latter refer to resources (broadly defined to encompass brand-name products, proprietary knowledge and product designs, scale and scope economies and so forth) that enable a firm to out-compete other firms in any specific value-chain activity and, therefore, to carry-out that activity in its preferred location(s).

To the extent that firm-specific advantages are largely independent of location-specific advantages, the influence of comparative advantage on the geographic pattern of international production is potentially diminished, since the location of specific production activities need not be strictly dictated by considerations of economic efficiency. Put differently, if firms enjoy certain competitive advantages derived (directly or indirectly) from market power, they have some scope to “dissipate” those advantages by locating production activities according to criteria other than efficiency, e.g., a preference on the part of senior managers to live in a particular location that is not the most efficient location for the activity in question.

In fact, comparative advantage-based models of international trade recognize that “market imperfections” can contribute to patterns of international production departing from patterns strictly predicted by comparative advantage (Staiger, Deardorff and Stern, 1987; Bergstrand, 1985). In some cases, market imperfections are created by tariffs and other government-imposed trade distortions. In other cases, market imperfections reflect what were identified earlier as firm-specific advantages related to market power, the possession of exclusionary intellectual property rights and so forth. In short, even the staunchest advocates of comparative (location) advantage as the basis for determining international geographic patterns of production would not claim that comparative advantage offers a complete explanation of the location of most production activities. Nevertheless, it is still a legitimate question to ask if comparative advantage is an increasingly less robust determinant of international production patterns as production activities are more finely fragmented along the value chain. Empirical evidence on this question will be reviewed in a later section of this report.

### ***3.3 Firm-Specific Advantages and Outsourcing***

In the eclectic model, as noted above, a host of factors potentially underlie firm-specific advantages. Indeed, since foreign firms generally experience various disadvantages (or liabilities) associated with doing business in locations with formal and informal

institutions different from those of their home markets, they must possess compensating competitive advantages in order to overcome specific liabilities of foreignness (LOFs) from which they suffer. In the broad FDI literature, intangible assets in the form of proprietary technology, managerial know-how, goodwill associated with brand name products and so forth are the main sources of MNCs' firm-specific advantages. Furthermore, within the eclectic model, as well as within the broad transaction cost literature, MNCs will choose to internalize their firm specific advantages, i.e., carry out themselves the value chain activities that draw upon the relevant intangible assets, when the transaction costs associated with engaging independently owned firms to utilize those assets in one or more value chain activities are prohibitively high, such that it is more efficient to carry out the value chain activities within its own foreign-based affiliates.

The internalization of production and trade within the MNC is generally explained by the transaction cost model. While it is beyond the scope of this paper to discuss the elements of transaction cost economics in detail, the main point is that the costs associated with arranging, monitoring and modifying transactions may be substantially higher when those transactions are carried out with arms-length partners than when carried out within the firm. Attributes of the relevant transactions, as well as the competitiveness of the relevant markets, will condition transaction costs. Presumably, there are potential economies associated with using outside suppliers including possible economies of scale and scope enjoyed by those suppliers; however, for many transactions, those economies might be more than offset by the incremental costs of transacting with independently owned suppliers and distributors.

Transactions encompassing activities whose sought-after outcomes are difficult to codify in advance, as well as highly uncertain in terms of achievability are typically thought of as having relatively high transaction costs and, therefore, likely to be internalized within the MNC. A traditional illustration of this type of activity is R&D. Yet the import of recent discussions of the outsourcing phenomenon is that more and more activities that formerly were internalized within the MNC are being outsourced to independently owned firms located abroad. In this context, those discussions raise the issue of whether existing theories of outsourcing need to be revised, and/or whether the empirical importance of transaction cost determinants are decreasing over time and, if so, why.

The empirical literature documenting the importance of transaction costs as a determinant of "make-or-buy" decisions by MNCs is too extensive to be reviewed in this report. Suffice to say that, as in the case of H-O models of international trade, transaction cost models of outsourcing decisions are less than fully deterministic. That is, proxy measures of transaction costs do not, by themselves, fully explain outsourcing decisions; however, the relevant issue from the perspective of this report is whether the transaction cost model is significantly less predictive as a determinant of outsourcing decisions when the value chain activity involves the production of specialized intermediate inputs, particularly those that involve what are traditionally identified as "white-collar" workers. This issue will also be considered in a later section of this report.

### ***3.4 Policy Issues***

As noted above, international specialization of production is hardly a new phenomenon, and the empirical evidence documenting the economic benefits of international specialization of production accompanied by international trade is too voluminous and well known to review here. To the extent that the growth of GVCs raises any new issues, it is arguably because the more "finely grained" international specialization

of production does not give rise to the same efficiency gains as broader patterns of geographic production specialization accompanied by trade, e.g., trade in finished goods. Arguably, any evaluation of the GVC phenomenon should therefore consider whether and why the gains from the international specialization of production might depend upon the degree of specialization characterizing any value chain. In particular, if international production specialization results in the relocation of any specific value chain activity to a location enjoying a comparative advantage in that activity, a more fine-grained (or extra-marginal) international specialization of production should lead to even more of the same “good thing”, i.e., increased efficiency and higher real incomes at the national level. Put differently, a policy issue raised is whether the gains from specialized production and international trade at the level of the home country should depend upon the extent to which specialization and trade increasingly encompasses intermediate inputs of all sorts as opposed to finished and semi-finished goods.

It was also noted above that MNCs have historically been instrumental in relocating production activities from home to host countries by undertaking FDI and coordinating international trade among their affiliates. While the evidence on the impacts of offshoring by MNCs is less voluminous than the available evidence on the gains from international trade, the basic conclusions are similar. Specifically, to the extent that the relocation of production activities within MNCs, accompanied by intra-firm trade, makes the process of international specialization of production more efficient, offshoring should contribute to higher real income levels for both host and home countries (Globerman, 1993). Furthermore, if outsourcing offshore production is more efficient for the MNC than carrying out offshore production in its own foreign affiliates, then offshore outsourcing should further improve the economic welfare of home countries. The policy question raised by expressions of concern about offshore outsourcing is, therefore, why should offshore outsourcing be economically disadvantageous for home countries when offshoring carried out within MNCs is economically advantageous?

In short, the policy issues surrounding GVCs and offshore outsourcing can seemingly be distilled into two relatively focused conceptual and, perhaps, empirical questions in the context of a fairly broad and consistent literature identifying net economic benefits to countries specializing in international production while trading with other countries, often using MNCs to carry out international trade: 1. why might the net economic benefits from specialized international production diminish when specialization involves more narrowly defined value chain activities? 2. why might the net economic benefits of offshoring by MNCs diminish if overseas production is outsourced to independently owned companies rather than carried out by the MNC’s foreign affiliates?

These policy issues will be addressed in a later section of the report. Before doing so, it is useful to assess whether traditional theories of international production and outsourcing are rendered less relevant with the emergence and growth of GVCs. Both theory and empirical evidence on this issue are presented in the next section of this report.

#### **4. Criticisms of the Conventional Wisdom**

In this section of the report, we identify and assess various recent criticisms that have been directed at traditional theories of international production and trade, as well as at offshore outsourcing, insofar as GVCs are concerned. We also review some recent empirical evidence bearing upon the practical relevance of those criticisms.

#### ***4.1 Theories of Trade as Applied to Intermediate Inputs***

Claims have recently been made that traditional theories of international trade must be substantially modified when applied to trade in intermediate inputs as compared to trade in final goods and services. Perhaps the most explicit statement of the shortcomings of the concept of comparative advantage as applied to modern international trade has been proposed by Michael Porter.<sup>7</sup> Porter argues that traditional trade theory, based around the idea of comparative advantage, focuses on a country's factor endowments of land, labour and capital, but that is not what is driving current patterns of trade between nations. Specifically, Porter argues that the international mobility of financial capital renders domestic endowments of that specific input an irrelevant determinant of comparative advantage. He further argues that it is not so much the quantity of labour that affects a nation's "competitiveness" in a given economic activity, but rather it is the specialized nature and "quality" of labour that is important.

It is somewhat unclear whether Porter is suggesting that the quality of labour is a newly important factor of production or whether previous studies of international trade failed to acknowledge the existence of different qualities of labour. In fact, neither interpretation seems defensible. In particular, both conceptual and empirical studies of North-South trade and FDI flows highlight the importance of human capital abundance in the North as a major determinant of trade and FDI flows from North to South.

Other authors offer a more specific criticism of traditional comparative advantage-based models of international production in claiming that those models are not relevant to understanding the relocation of value chain activities, such as R&D. For example, Lewin, Massini and Peeters (2009, p.901) assert that: "The reasons underlying the decisions by firms to offshore value-adding innovative activities remain to be understood conceptually as well as empirically." Others have indirectly suggested that comparative advantage is an increasingly misguided theory of international production with the growth of vertical specialization, particularly with the separation of the R&D and product design stages of the value chain from the manufacturing stage. In particular, the offshoring of "high-end" business processes and other administrative and technical services to developing countries such as China and India is seen as challenging the relevance of comparative advantage-based models, since developed countries are presumed to enjoy a relative abundance of highly skilled scientists and engineers (Manning, Massini and Lewin, 2008).

On balance, it seems fair to conclude that most criticisms of the application of comparative advantage-based models to GVCs rest not on specific theoretical considerations but, rather, derive from the empirical observation that the international specialization of value chain activities increasingly involves R&D, product design and other white collar-intensive activities being relocated to countries that historically have experienced comparative disadvantages in those activities. One possibility that is consistent with traditional theory is that patterns of comparative advantage are changing with a shift in the global pool of scientists and engineers. In this regard, Manning, Massini and Lewin (2008) among others note that the number of U.S. and European scientific and engineering (S&E) graduates is stagnating, while the pool of S&E talent in emerging economies such as China and India is growing rapidly. Nevertheless, there are few experts who would argue that China and India are more human capital intensive in relative terms than the U.S. and Europe. Hence, the relocation of human capital intensive activities to

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<sup>7</sup> Porter's arguments are discussed in Snowson and Stonehouse (2006).

emerging market economies seems, on the surface, to contradict the predictions of H-O type models.

In fact, Markusen (2005) provides an explanation of the offshoring of white collar services to developing countries such as China and India that is consistent with comparative advantage-based models of international production. Specifically, Markusen posits that while white collar workers in developing countries are relatively scarce in number compared to their counterparts in developed countries, the former are relatively cheap compared to the latter because the former have relatively low marginal productivities. The reason is that knowledge is a complementary input to skilled labour, and developing countries are relatively deficient in knowledge. It is therefore efficient to move some production to developing countries where that production utilizes relatively intensively the services of white collar workers who specialize in activities where knowledge is a relatively weak complement, e.g., call centers. On the other hand, production that utilizes relatively intensively the services of white collar workers with skills that are strong complements to knowledge will remain concentrated in developed countries.

Markusen's model, in effect, suggests that white collar activities across stages of any GVC should be differentiated by their knowledge-intensity. As specialization of production increases, degrees of knowledge intensity of specific value chain activities are increasingly relevant determinants of comparative advantage. In particular, one might well observe activities such as R&D and product design being offshored to countries such as China and India, but the offshored R&D and product design activities are likely to be significantly less knowledge-intensive than those whose production is concentrated in developed countries. In this context, the issue of whether or not recent trade in intermediate inputs simply requires finer classifications of comparative advantage in order to be consistent with H-O type models is an empirical one. In the next section, some available evidence on the issue is summarized and assessed.

#### *4.1.1 Trading Tasks*

Arguments have been made that while comparative advantage still generally determines the geographical pattern of trade in intermediate inputs, some important inferences drawn from H-O type models of trade in final goods are unreliable when those models are applied to the offshoring of intermediate inputs. In this regard, Grossman and Rossi-Hansberg (2006; 2008) discuss the offshoring phenomenon in terms of "trading tasks" whereby the production process is modeled as a continuum of discrete tasks. Within this framework, offshoring of specific tasks can lead to productivity improvements in the importing sector which, in turn, can lead to an expansion of output in that sector and an increase in wage rates for factor inputs in that sector. Furthermore, offshoring of specific tasks can occur even in sectors of the economy that enjoy a comparative advantage. Put differently, a country might be at a comparative disadvantage in one or more specific tasks, even if it enjoys a comparative advantage in the bulk of the tasks carried out in a particular industry. Offshoring the tasks for which other locations enjoy a comparative advantage could increase productivity in the tasks retained by the outsourcing firms.

Since specific tasks might be outsourced in virtually all sectors of an economy, Baldwin (2009) argues that a fundamental difference between the trading tasks models of trade and older models of trade is that, since offshoring can affect all sectors, it is unclear which groups in society will gain or lose from increased trade intensity. In particular, the relative productivity and wage effects of offshoring tasks are uncertain. More important,

perhaps, it is unclear whether any specific nation will gain or lose from increased trade. For example, to the extent that there are technology spillovers across countries associated with outsourcing tasks, domestic firms engaged in offshore outsourcing might collectively undermine the competitive advantages they enjoy in international markets as offshore rivals acquire capabilities similar to those of the domestic firms through international technology transfers. Increased competition from offshore firms might, in turn, adversely affect the terms-of-trade for a nation, as export prices decline owing to increased supply of the intermediate inputs or final products affected by the increased competition.

While modeling offshoring as trade in tasks rather than trade in goods arguably captures more accurately the concerns surrounding offshore outsourcing of services, it is unclear whether the insights gained from such modeling are unique. In particular, it has long been acknowledged that changes in terms-of-trade that accompany globalization can harm some countries while helping others (Jones, 2006). It has also been recognized that offshoring can be equivalent to factor-augmenting technological change, and that the latter can result in relative wage and price changes that have ambiguous effects on the distribution of income within countries. Put slightly differently, while factor prices are assumed to remain unchanged in H-O type comparative advantage models, the implications of terms-of-trade effects have been extensively discussed in the older literature. Furthermore, the potential productivity impacts of offshoring have been acknowledged and incorporated into more traditional comparative advantage-based models of trade (Bhagwati, Panagariya and Srinivasan, 2004).

In this context, Jones (2006) and Bhagwati, Panagariya and Srinivasan (2004) argue that offshore outsourcing is fundamentally a trade phenomenon, and that subject to the usual theoretical caveats and practical responses, offshore outsourcing results in gains from trade. Furthermore, the effects of offshore outsourcing on jobs and wages are not qualitatively different from those of international trade in goods.

#### *4.1.2 Other Determinants of Trade*

It has also been argued that traditional trade models fail to capture the importance of changes in technology that affect transportation and communications. Such changes are suggested to underlie the growth of production fragmentation and, in particular, the offshoring of services. As Baldwin (2009), among others, argues, the geographical separation of various production stages became more economically attractive as it became less costly to co-ordinate complex tasks across geographic distances. Reductions in direct and indirect costs of coping with geographic distances are largely owing to cheaper and more reliable telecommunications, information management software and increasingly powerful personal computers. These developments radically diminished the difficulty of organizing group-work across physical distances, so that stages of production can be dispersed without dramatic reductions in efficiency or timeliness.<sup>8</sup>

It seems fair to argue that traditional trade models do not focus on the role played by changes in technology as they specifically affect the costs and related difficulties of organizing group-work across geographic distances; however, the impact of trade liberalization initiatives is a key feature of traditional trade models, and reductions in effective communication and transportation costs might be seen as being equivalent to

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<sup>8</sup> Government policies reducing trade barriers also promote production fragmentation by making exporting and importing more profitable when carried out on a larger scale, thereby reducing in importance the discouraging impact of fixed and sunk costs associated with buying and selling internationally. For a rigorous discussion of this point, see Baldwin (2009).

trade liberalization initiatives in reducing costs of exchange over between countries, although reductions in costs of trade resulting from trade liberalization initiatives do not necessarily promote trade between more physically distant partners. In short, the trade-enhancing effects of technological change can be seen as similar to the trade-enhancing effects of reductions in tariff and non-tariff barriers to trade, although the specific impacts of technology on coordination of work-groups do seem to be more relevant to increased trade in tasks, whereas trade liberalization might be more relevant to increased trade in finished goods.

Jones (2006) suggests that a country's communications and transportation infrastructure should be incorporated into trade models by treating infrastructure explicitly as a critical determinant of a country's comparative advantage. For example, he argues that China enjoys good harbors and highways compared to India, while India enjoys good information technology infrastructure compared to China. This contributes to China enjoying an advantage in outsourced manufacturing and India enjoying an advantage in outsourced services. More generally, improvements in a country's communication and transportation infrastructure enable firms in that country to participate more efficiently in global supply chains which, in turn, facilitates a nation's trade integration with other countries.

#### ***4.2 Evidence on Comparative Advantage and Trade in Intermediate Inputs***

A variety of studies offer some empirical evidence on the applicability of comparative advantage-based models to the international specialization of production for intermediate inputs. On balance, they support the relevance of those models. For example, Swenson (2007) examines the evolution of overseas assembly programs (OAP) activities between 1980 and 1994. This program encompassed a diverse cross-section of U.S. outsourced imports. Her empirical model examines the factors that influenced whether a country participated in OAP or not. The probability of participation increased with declines in own-country costs or increases in competitor-country costs. Developing country outsourcing assembly responded most vigorously to changes in own country or competitor costs. Cost sensitivity was also higher in industries populated by a wider range of potential country suppliers. Swenson's findings suggest that OAP activities are influenced by the relative costs of different locations which is certainly consistent with the predictions of comparative advantage-based models. She also notes that there is some inertia in outsourcing partner switches which appears to be related to sunk costs of search and investment.

In a similar vein, Kumar, van Fenema and Von Glinow (2009) report the results of a 2006 survey of offshoring in U.S. public and private sector organizations post-2004. They find that the decision to distribute and locate an offshored task depends on differences in production costs at various sites. Cusmano, Mancasi and Morrison (2008) focus on outsourcing of activities by firms in Lombardy, Italy. They find that firms tend to take advantage of factor price differences across countries and regions in their outsourcing decisions. Borga and Zeile (2004) provide results supporting the hypothesis that firms do divide up the production process and locate different stages of that process to take advantage of relative factor-cost differences. Their results also underscore the association of intra-firm trade in intermediate inputs with fragmented production processes and identify that this trade is most prevalent for affiliates located in countries that offer cost advantages. Finally, Beugelsdyk, *et. al.* (2008) using data on trade flows of U.S. MNC affiliates over the period 1983-2003 find evidence indicating higher value chain



disaggregation (vertical specialization) over time, as well as the systematic exploitation by MNCs of factor cost differences across countries.

To be sure, some authors claim to find evidence contradicting the inferences drawn from H-O type models when applied to outsourcing. For example, Bunyaratave, Hahn and Doh (2007) find that education levels and cultural similarity are significant drivers of offshoring location choices. Hence, firms locate offshoring facilities in destinations that are closer in wages to the home country. Other recent studies question the importance of relative cost differences as determinants specifically of the location of R&D and related product design and development activities. For example, Lewin, Massini and Peeters (2009) find that cost-saving opportunities are an important driver for many offshore implementations, but when firms need to support their product development strategies in the face of talent scarcities, labour cost considerations are less important relative to accessing talent elsewhere. They also report that between 1990 and 2003, offshoring of product design projects was driven by the objective of reducing costs and by the need to increase “speed to market”; however, in the post-2003 period, access to qualified personnel emerges as the strongest driver of offshoring product development projects.<sup>9</sup>

It is unclear whether there is a meaningful distinction between “availability” and “relative cost” as a determinant of offshoring of R&D and related activities. Specifically, one can interpret limited availability of scientists and engineers to mean that the supply curve is relatively steeply sloped in the region of current employment, so that the marginal costs of hiring additional scientists and engineers are relatively high. Hence, even if average costs are lower in location A than in location B, the incremental costs of hiring additional scientists and engineers in location A might be higher than the incremental costs of doing the hiring in location B. Since hiring decisions are made at the margin, it is difficult from the available information provided in the relevant studies to conclude that relative cost is not important in outsourcing R&D, even when managers report that availability of scientists and engineers is the key motivation for offshoring.

In summary, while the available evidence is certainly limited, it does not suggest that the increased specialization of international production observed in recent years is also increasingly inconsistent with traditional explanations of the geographic location of production activities. Indeed, no plausible theoretical argument has been made to support an inference that new theories of international production are needed as vertical specialization increases. While there is little empirical evidence on the factors influencing vertical specialization, the conceptual explanations typically offered highlight the role of technological change. As discussed in an earlier section, changes in communications technology that facilitate efficient management of production networks across borders have been especially highlighted, as have improvements in management information systems and other management skills which also contribute to lower coordination costs associated with managing international production networks; however, such changes have been ongoing for decades, even if the Internet itself is a relatively recent phenomenon. If the economic forces contributing to increased vertical specialization are, indeed, evolutionary, there is little reason to believe that “revolutionary” theories are required to explain the GVC phenomenon.

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<sup>9</sup> The claim that “access” rather than cost is the strongest motivator of decisions to offshore higher skilled functions is also found in Manning, Massini and Lewin (2008).

### ***4.3 Evidence on Offshore Outsourcing***

As discussed earlier in the report, conventional theory predicts that MNCs will choose to outsource offshored activities if the (presumed) additional transaction costs of outsourcing (relative to internal production) are low relative to the efficiency gains associated with having a specific production activity undertaken by one or more independently owned firms that enjoy firm-specific advantages in that activity. Furthermore, through vertical specialization, the outsourcing firm might itself enjoy increased efficiencies by focusing more of its resources on those activities in which it enjoys firm specific advantages.

There appears to be only a limited number of empirical studies that directly or indirectly test the relevance of the transaction cost model to offshore outsourcing. The seeming challenge to conventional theory in this regard is that offshore outsourcing is no longer concerned with specialized, repetitive tasks. Rather, offshore outsourcing has grown to encompass a wide range of activities, including “sensitive” functions and knowledge-intensive activities such as R&D and product design. Nevertheless, Cusmano, Mancasi and Morrison (2008) remark for a sample of firms in the Lombardy region of Italy that the conventional inferences from the transaction cost framework are supported by the behaviour of their sample of firms. Specifically, they observe the emergence of loose networks of firms when transactions do not entail complex tasks and can be governed by well codified procedures; however, “tighter” ties among firms tend to be present, including sourcing to foreign affiliates, when tasks are complex and/or no “reliable” partners are present. Furthermore, they find that offshoring of R&D and design activities are positively associated with product innovation and innovation performance when the offshored activities are carried out by a member of the same corporate group as the outsourcer.

Similarly, Lewin, Massini and Peeters (2009) report that owing to concerns about a possible loss of control over strategically important activities, most companies offshoring product activities favor offshoring through a fully owned affiliate, although the importance of controlling product design activities through captive organizations is declining in recent years. The latter phenomenon appears to be the result of innovations in corporate management which facilitate better organization and administration of product design projects carried on outside the organization, as well as the growth of specialized firms offering innovative and specialized services or, equivalently, the growing potential for economic benefits associated with outsourcing product design services holding transaction costs constant. Mankiw and Swagel (2006) discuss the possibility that improved technology and improved legal institutions and governance in foreign destinations are also encouraging offshore outsourcing of more “complex” activities.

## **5. Suggested Policies Toward GVCs and Offshore Outsourcing**

The evidence reviewed in this report suggests that there is no basis for arguing that new theories are required to understand patterns of international production given greater specialization of value chain activities. In particular, the role of comparative advantage-based specialization of production and comparative advantage-based trade continues to be relevant to understand patterns of production for GVCs. If anything, acknowledgement that non-traditional determinants of comparative advantage, particularly communications infrastructure and computer-enabled MIS systems, are becoming more relevant might usefully enhance traditional trade models.

Notwithstanding the empirical evidence, some continue to argue that conclusions with respect to gains from specialization and trade may need to be revised in light of specialization of GVC activities. Most of the concerns raised about the potential adverse consequences of the growth of GVCs are not new. In particular, concerns that higher value-added activities with their associated desirable jobs will be relocated offshore by MNCs are long-standing and are not unique to the offshoring of ever more specialized value chain activities. Specific concerns about R&D activities being indirectly moved outside the home country are also long-standing in Canada. The phenomenon giving rise to this concern in the past was the acquisition of Canadian-owned companies by foreign-owned companies. Such acquisitions were seen as triggering the truncation or elimination of R&D activities in the acquired company in favour of carrying out those activities in larger R&D facilities in the acquiring firm's home country (or other large) affiliate.

Given the extensive literature that has accumulated over time focusing on public policy concerns about the geographic relocation of production activities by MNCs, it is important to assess whether the emergence and growth of GVCs raises public policy issues that are not addressed, or inadequately addressed, in this literature. Put specifically, why should the gains from international specialization of production, accompanied by trade, be compromised by increased vertical specialization of production? Critics merely point to the loss of high-paying white collar positions, but this is the same objection to specialization and trade that has been raised with regard to the loss of high-paying manufacturing employment. In the latter case, manufacturing employment losses in developed countries have been more than offset by the growth of even higher-paying service jobs.<sup>10</sup> In this regard, there is no theoretical or empirical basis to argue that offshoring R&D and related employment will not be offset by a growth of even higher – paying human-capital intensive jobs in developed countries, including Canada. Any argument for policy intervention to discourage the offshoring of specialized production activities must look elsewhere for its justification.

### ***5.1 Reconsidering Public Policy Towards Offshoring***

While carefully articulated arguments about new threats to domestic economic prosperity associated with outsourcing are difficult to identify in the literature, the heart of any such argument seems rooted in the relatively long-standing concern about weakening the innovative capacity of the home country. In particular, two specific concerns about outsourcing higher value-added production activities can be identified: 1. to the extent that product design, R&D and other knowledge-intensive activities are partly or wholly separated from other value chain activities and then offshored, technology spillovers associated with domestic innovation activities may be reduced. As a consequence, even though there are efficiency gains to international specialization, the loss of domestic technology spillovers might attenuate those efficiency gains by reducing domestic innovation; 2. innovation and production “clusters” in affected industries will be weakened if specific value chain activities are segmented and offshored. The notion here is that agglomeration economies are a major contributing factor to productive clusters, and agglomeration economies, in turn, arise from the geographic concentration of heterogeneous skilled professional and technical workers.

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<sup>10</sup> Yan (2006) finds that the purchase of foreign intermediate inputs by Canadian firms leads to a fall in the demand for unskilled labour in Canada but an increase in the relative demand for skilled labour.

Both technology spillovers and agglomeration economies are examples of external economies of scale that are associated with industrial and service clusters. Hence, both observations emphasize the potential for the offshoring of specialized value chain activities, particularly R&D, product design and product development activities to lead to a loss of efficiency in the domestic economy owing to foregone external economies of scale; however, as noted above, if offshoring (directly or indirectly) facilitates the importation of more efficiently performed product design and development “services”, as well as other inputs to the value chain activities retained in the domestic economy, then the efficiency of those latter activities might actually increase.<sup>11</sup> In particular, offshoring might facilitate international technology spillovers that benefit domestic producers in various domestic value chain activities.

In this context, the policy issue surrounding current offshoring activities is similar to concerns raised about “importing” technology rather than encouraging domestic R&D and related activities through subsidies and other public policies. The basic issue is whether the anticipated net (of social costs) gains from domestic technology spillovers associated with R&D performed in the home country outweigh the anticipated efficiency spillovers (net of social costs) from utilizing technology produced abroad, presumably more cheaply or of “higher quality.”<sup>12</sup> The fact that the issue is focused on R&D and product development related to intermediate inputs rather than final goods would not seem to make the issue unique to the discussion surrounding GVCs. Hence, there is no obvious basis for arguing that the GVC phenomenon requires a new perspective on the basic policy questions of whether and by how much should government subsidize domestic innovation activities. There is also no obvious basis for arguing that the GVC phenomenon requires a new perspective on the offshoring of specific activities by Canadian MNCs. In short, the evidence, to date, suggests that the geographic specialization of production undertaken primarily by MNCs has been efficiency-enhancing for host and home countries, and there are no compelling theoretical or empirical grounds to argue that this conclusion is less reliable as vertical specialization by MNCs deepens. This is especially true in the case of small countries such as Canada where domestic “terms-of-trade” for intermediate inputs are unlikely to be affected by how much insourcing or outsourcing of those activities is done by Canadian companies.<sup>13</sup>

### ***5.2 Is Offshore Outsourcing Harmful to the Home Economy?***

If it can be agreed that offshoring is likely to improve economic efficiency for home and host countries, a specific question arising is whether the efficiency gains are likely to be attenuated if offshoring of GVC activities is done through outsourcing? Goldfarb (2004) summarily dismisses the relevance of drawing distinctions between the two modes

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<sup>11</sup> For some evidence that the stock market assigns a positive value to firms’ announcements that they are initiating global product design and development strategies, see Ojah and Monplaisir (2003).

<sup>12</sup> Technology from abroad will often be embodied in intermediate imports that are imported. For evidence of the empirical relevance of this phenomenon, see Goldberg, *et. al.* (2009) and Kugler and Verhoogen (2009).

<sup>13</sup> The terms of trade argument basically maintains that outsourcing by individual firms might, in the aggregate, lead to higher prices for imported (outsourced) intermediate inputs, as aggregate import demand for those inputs increases. In effect, a pricing externality is created as individual firms seek to lower costs through importing intermediate inputs but, in so doing, they contribute to increased prices of those inputs for importers as a whole.

of outsourcing in asserting that the economic results from intra-company trade are likely to be the same as those from arms-length transactions; however, an argument might be made that offshore outsourcing leads to a “leakage” of technology to foreign-owned competitors of Canadian firms that is less likely to occur when offshoring technology-related activities is done within Canadian MNCs.

The technology leakage argument is also not a new one. Indeed, it was raised in the context of early joint-ventures between North American car manufacturers and Japanese car manufacturers. Specifically, the view of some experts was that North American companies would effectively make expertise available to Japanese companies which, in turn, would enable Japanese manufacturers to become more formidable competitors sooner than would otherwise have taken place. It is difficult to assess this argument with confidence, since it assumes a counter-factual which cannot be tested. Namely, that Japanese companies would not have become the formidable competitors they became had those early joint ventures not been entered into by North American companies.

In the absence of compelling evidence to the contrary, it seems reasonable to assume that Canadian companies that voluntarily enter into offshore outsourcing arrangements, including those involving R&D and other innovation-related activities, do so because they view the arrangement as the most efficient alternative for their companies. While this might not always prove to be the case *ex post*, it is difficult to justify the imposition of public policies restricting specific types of offshore outsourcing based on a presumption that companies will be systematically incorrect in their assessment of the private benefits of offshore outsourcing; however, one might invoke an argument that any leakage of technological and managerial expertise that does occur harms both the firm doing the outsourcing and those domestic firms that do not outsource. The idea here is that the leaked knowledge and/or expertise weakens the competitive position of other Canadian firms besides the firm doing the offshore outsourcing and might thereby lead to reduced income levels of Canadian factors of production. In effect, the leakage of technology and expertise could inflict broad-based negative externalities on the Canadian economy.

Whatever the practical relevance of this (negative) externalities concern, it is not clear that it justifies direct government intervention into offshore outsourcing activities. Indeed, it is difficult to make a persuasive case for such intervention. For one thing, there might well be positive externalities to offshore outsourcing which more than offset any negative externalities overall. For another, it would be impossible, as a practical matter, for governments to assess which specific offshore outsourcing initiatives give rise to negative externalities of the type described above. The only practical policy would be to use policy instruments such as taxation to discourage all offshore outsourcing which would arguably be extremely costly to domestic efficiency.

### **5.3 Re-assessing the Overall Policy Framework**

A number of authors have argued that while the emergence and growth of GVCs can be a source of improved efficiency for Canadian firms involved in international business, public policies should be modified or reshaped to ensure that Canadian firms will fully benefit from the GVC and offshore outsourcing phenomena.

In fact, most of the specific policy suggestions that can be identified overlap traditional policy prescriptions for governments to implement in order to leverage gains from international trade. In particular, governments are seen as having a legitimate and valuable role to play in promoting the legal, physical and educational infrastructure of the home country which, in turn, facilitates efficient domestic production and the ability of

domestic firms to engage in international trade. Yip (2007) is a prominent example of a GVC strategy expert who puts at the top of his list of things that governments need to do to attract value chain activities traditional policies that have been identified as promoting a country's ability to engage efficiently in international trade, as well as attract inward FDI. Specifically, at the top of his list are: 1. good infrastructure; 2. access to transportation and (air) ports; 3. skilled workers. More controversial, perhaps, are the other items he highlights which include low taxes and "easy conditions of employment."

Trefler (2008) asserts that many Canadian firms have yet to recognize the sea change in their sourcing possibilities. Nor do they adequately understand that offshoring will enable them to concentrate on core activities which will improve their efficiency and competitiveness. He argues that better information about strategic offshoring options is needed by Canadian firms. While Trefler does not explicitly call for government policies to rectify the information gap he identifies, it seems fair to presume that it is an implicit call for appropriate public policies; however, it is unclear why governments would have more information than private sector firms about the strategic benefits and options surrounding outsourcing. Less controversially, Trefler calls for domestic public policies that encourage investment in upgrading and innovation by individuals (i.e., human capital) and firms (R&D).

Other suggestions have focused specifically on improving the capabilities of domestic firms (particularly small and medium-sized firms) to participate in GVCs. Many of the specific suggestions involve actions that must be initiated by the domestic firms themselves. One such suggestion is that companies work to establish stable and sustainable relationships with "high-performance" partners that have the ability to make substantial contributions to value chain activities ranging from product design to customer service (Krywulak and Kukushkin, 2009). Another is that firms improve their abilities to coordinate and manage value chains involving multiple partners, as well as participate in GVCs. Specific attributes highlighted in this regard are a firm's financial stability, compliance with industrial standards and certifications, production capacity, flexibility and electronic capability (Krywulak and Kukushkin, 2009). Again, while these suggestions seem quite reasonable, it is unclear what public policy implications follow from them.

Perhaps the broadest public policy implication one might draw from the recent literature on GVCs is that the Canadian government's role in facilitating the freer international flow of goods, services, capital and people is still extremely important, since a "thicker" Canadian border clearly reduces the attractiveness of Canadian companies as GVC partners. In this regard, recent concerns that border security and related measures put in place after 9/11 have thickened the Canada-U.S. border and, perhaps, also increased trade costs between Canada and other trading partners merit serious attention and remediation.<sup>14</sup> While U.S. government policies are certainly a major contributor to border thickening between Canada and the U.S., the challenge facing the Canadian government is to encourage changes in U.S. government policies that unduly increase the costs of bilateral trade and investment, particularly when those policies are motivated primarily by domestic protectionist pressures in the United States. In a broad sense, this too represents more of a continuation of long-standing Canadian public policies than any new direction for policy arising from the growth of GVCs and offshore outsourcing.

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<sup>14</sup> For some discussion of a possible thickening of the Canada-U.S. border, see Globerman and Storer (2008) and Hodgson (2008), among others.

## 6. Summary and Conclusions

In summary, the offshoring and outsourcing phenomena are largely consistent with established theory that has guided public policy essentially since the initiation of the GATT Round of trade liberalization. In particular, increased vertical production and trade specialization are efficiency enhancing for both home and host countries, as has been empirically established for production and trade specialization in the case of finished and semi-finished products.<sup>15</sup> Furthermore, and notwithstanding the enormous recent attention being paid by academics and policy analysts to the GVC and offshore outsourcing phenomena, it is not at all obvious that the growth of these phenomena change public policy imperatives in any significant way. Specifically, the appropriate broad roles of government continue to be investing in social infrastructure capital (both physical and human), ensuring that the legal and regulatory environments of Canada are conducive to efficient economic production while meeting social needs related to public health and safety, and continuing to negotiate liberalized trade and investment conditions with Canada's international trading partners.<sup>16</sup>

It might be argued that increased international vertical specialization necessitates "finer grained" public policies. For example, while tax rate differences at the national level have not been found to be consistently important determinants of foreign direct investment flows at the aggregate or industry levels, the location of specific value chain activities might be significantly affected by differences in tax rates across countries and regions. In fact, there is little available empirical evidence on the determinants of the geographical location of specific value chain activities. Furthermore, since firms are ordinarily taxed on the basis of their profits, it is unclear whether one can meaningfully discuss tax policy at the level of the individual value chain activity. As a general matter, the "conventional wisdom" with respect to corporate tax rates would seem to apply whatever the degree of specialization of production that multinational companies undertake. Namely, higher tax rates that are not offset by (direct or indirect) productivity – enhancing public services make a location less attractive to investors, all other things constant.

To be sure, it would be useful to know more about the determinants of GVCs and offshore outsourcing activity, particularly from a Canadian standpoint, both to strengthen the tentative conclusions drawn in this report, as well as to identify whether public policy priorities are changing as a result of increasing vertical specialization and outsourcing. Research in this area might be particularly helpful in ensuring that infrastructure and related policies at the federal and provincial government levels are complementary. In particular, the importance of technology clusters as a magnet for corporate investment has been amply documented in the literature. Competition amongst provinces to create clusters meant to attract similar types of value chain activities in the same industries is likely to be wasteful and even self-defeating, as scarce domestic resources are spread thin across geographic locations within Canada. Hence, government expenditures on physical and social infrastructure should be guided, at least in part, by the location advantages of regions within Canada with respect to specific activities within particular industries.

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<sup>15</sup> Treffler (2005) concurs that the available evidence supports a conclusion that offshoring leads to higher productivity, although he cautions that we have little hard evidence of the relationship for technology-intensive industries.

<sup>16</sup> Barriers to internal labour market mobility, such as provincial licensing restrictions for professionals, also attenuate labour market adjustments that enhance the net benefits of offshore outsourcing.

**References**

- Antras, Pol (2005), "Property Rights and the International Organization of Production", *American Economic Review, Papers and Proceedings*, 95 (2), pp. 25-32.
- Asakawa, Kajuhiro and Ashok Som (2008), "Internationalization of R&D in China and India: Conventional Wisdom versus Reality", *Asia Pacific Journal of Management*, Vol. 25, pp. 375-394.
- Baldwin, Richard (2009), "Integration of the North American Economy and New Paradigm Globalization", Ottawa: Government of Canada, Policy Research Initiative, Working Paper Series 049.
- Bardhan, Ashok and Dwight Jaffee (2005), "Innovation, R&D and Offshoring", University of California, Berkeley: Fisher Center Research Report.
- Bergstrand, Jeffrey (1985), "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence", *The Review of Economics and Statistics*, Vol. 67, pp. 474-481.
- Beugelsdyk, Sjoerd, Torben Pedersen and Bent Petersen (2008), "Is There a Trend Toward Global Value Chain Specialization? An Examination of Cross Border Sales of U.S. Foreign Affiliates", SMG Working Paper 24, Copenhagen Business School, mimeo.
- Bhagwati, Jagdish, Arvind Panagariya and T.N. Srinivasan (2004), "The Muddles Over Outsourcing", *The Journal of Economic Perspectives*, 18 (4), pp. 93-114.
- Borga, Maria and William Zeile (2004), "International Fragmentation of Production and The Intrafirm Trade of U.S. Multinational Companies", Washington, D.C.: U.S. Department of Commerce, Bureau of Economic Analysis, WP 2004-02.
- Bunyaratave, Kraiwinee, Eugene Hahn and Jonathan Doh (2007), "International Offshoring of Services: A Parity Study", *Journal of International Management*, 13 (1), pp. 7-21.
- Cantwell, John (1995), "The Globalisation of Technology: What Remains of the Product Cycle Model?", *Cambridge Journal of Economics*, 19 (1), pp.155-174.
- Cohen, Stephen, Alberto Di Minin, Yasuyuki Motayana and Christopher Palmberg (2009), "The Persistence of Home Bias for Important R&D in Wireless Telecom and Automobiles", *Review of Policy Research*, 26 (1-2), pp. 55-76.
- Cusmano, Lucia, Maria Luisa Mancusi and Andrea Morrison (2006), "Globalisation of Production and Innovation: How Outsourcing is Reshaping an Advanced Manufacturing Area", CESPRI, WPn.194.
- Cusmano, Lucia, Maria Luisa Mancasi and Andrea Morrison (2008), "Innovation and the Geographical and Functional Dimensions of Outsourcing: An Empirical Investigation Based on Italian Firm Level Data", Utrecht University, Papers in Evolutionary Economic Geography.



- Dunning, John and Sarianna Lundon (2009), “The Internationalization of Corporate R&D: A Review of the Evidence and Some Policy Implications for Home Countries”, *Review of Policy Research*, 26 (1,2), pp.13-33.
- Feenstra, Robert (1998), “Integration of Trade and Disintegration of Production in the Global Economy”, *Journal of Economic Perspectives*, Fall, pp.31-50.
- Globerman, Steven and Paul Storer (2008), *The Impact of 9/11 on Canada-U.S. Trade*, Toronto: University of Toronto Press.
- Goldberg, Pinelopi, Amit Khandelwal, Nina Pavcnik and Petia Topalove (2009), “Trade Liberalization and New Imported Inputs”, *American Economic Review, Papers and Proceedings*, 99 (2), pp. 494-500.
- Goldfarb, Danielle (2004), “How Canada Wins From Global Services Outsourcing”, Toronto: C.D. Howe Commentary, No. 2006.
- Grossman, Gene and Esteban Rossi-Hansberg (2006), “The Rise of Offshoring: It’s Not Wine for Cloth Anymore”, Princeton University, mimeo.
- Grossman, Gene and Esteban Rossi-Hansberg (2008), “ Trading Tasks: A Simple Theory Of Offshoring”, *American Economic Review*, 98 (5), pp. 1978-1997.
- Hodgson, Glen (2008), *Making Integrative Trade Real: Creating Value Chain Trade Policy for North America*, Toronto: The Conference Board of Canada.
- Huggins, Robert, Mehmet Demirbag and Violina Iankova (2007), “Global Knowledge and R&D Foreign Direct Investment Flows: Recent Patterns in Asia Pacific, Europe and North America”, *International Review of Applied Economics*, 21 (3), pp.437-451.
- Jones, Ronald (2006), “Production Fragmentation and Outsourcing: General Concerns”, Rochester: University of Rochester, mimeo.
- Krywulak, Tim and Vadim Kukushkan (2009), “Big Gains with Small Partners: What MNCs Look For in Their SME Suppliers”, Toronto: The Conference Board of Canada.
- Kuemmerle, Walter (2000), “Building effective R&D Capabilities Abroad”, Cambridge: Harvard Business School, mimeo.
- Kugler, Maurice and Eric Verhoogen (2009), “Plants and Imported Inputs: New Facts And an Interpretation”, *American Economic Review, Papers and Proceedings*, 99 (2),
- Kumar, Kuldeep, Paul van Fenema and Mary Ann von Glinow (2009), “Offshoring and The Global Distribution of Work: Implications for Task Interdependence Theory and Practice, *Journal of International Business Studies*, 40, pp.642-667.
- Lewin, Arie, Silvia Massini and Carine Peeters (2009), “Why are Companies Offshoring Innovation? The Emerging Global Race for Talent”, *Journal of International Business Studies*, 40, pp.901-925.
- Mankiw, N. Gregory and Phillip Swagel (2006), “The Politics and Economics of Offshore Outsourcing”, *Journal of Monetary Economics*, 53 (5), pp. 1027-1056.

- Manning, Stephan, Silvia Massini and Arie Lewin (2008), "A Dynamic Perspective on Next-Generation Offshoring: The Global Sourcing of Science and Engineering Talent", *Academy of Management Perspectives*, pp.35-54.
- Markusen, James (2005), "Modelling the Offshoring of White Collar Service From Comparative Advantage to New Theories of Trade and FDI", Boulder: University of Colorado, mimeo.
- Markusen, James and Bridget Strand (2006), "Trade in Business Services in General Equilibrium", Boulder: University of Colorado, mimeo.
- Markusen, James and Anthony Venables (2007), "Interacting Factor Endowments and Trade Costs: A Multi-Country, Multi-Good Approach to Trade Theory", Boulder: University of Colorado, mimeo.
- Organization for Economic Cooperation and Development (2007), "Moving up the (Global) Value Chain", *OECD Observer*, Policy Brief, pp. 1-7.
- Ojah, K. and Leslie Monplaisir (2003), "Investor's Valuation of Global Product Design and Development", *Journal of International Business Studies*, 34 (5), 457-472.
- Slywatzky, Adrian (2009), "How Science Can Create Millions of New Jobs", *Business Week*, September 7, pp.37-39.
- Snowdon, Brian and George Stonehouse (2006), "Competitiveness in a Globalised World: Michael Porter on the Microeconomic Foundation of the Competitiveness of Nations, Regions and Firms", *Journal of International Business Studies*, 37, pp. 163-175.
- Staiger, Robert, Alan Deardorff and Robert Stern (1987), "An Evaluation of Factor Endowments and Protection as Determinants of Japanese and American Foreign Trade", *Canadian Journal of Economics*, XX (3), pp. 449-463.
- Swenson, Deborah (2007), "Competition and the Location of Overseas Assembly", *Canadian Journal of Economics*, 40 (1), pp. 55-75.
- Sydor, Aaron (2007), "The Rise of Global Value Chains", Ottawa: Minister of Public Works and Government Services Canada.
- The Conference Board of Canada (2008), "Making Integrative Trade Real: Creating a Value Chain Trade Policy for North America", Ottawa: The Conference Board of Canada, mimeo.
- Treffler, Daniel (2005), "Policy Responses to New Offshoring: Think Globally, Invest Locally", Paper prepared for Industry Canada's Roundtable on Offshoring, Ottawa, March 30, mimeo.
- Treffler, Daniel (2008), "Policy Responses to the New Offshoring: Think Globally, Invest Locally", Ottawa: Industry Canada Working Paper Series, 2008-11-25.
- Yan, Beiling (2006), "Demand for Skills in Canada: The Role of Foreign Outsourcing And Information-Communication Technology", *Canadian Journal of Economics*, 39 (1), pp. 53-67.
- Yip, George (2007), "Global Value Chains Paradigm", Paper presented at Industry Canada, Global Value Chains Conference, Ottawa, September 25: mimeo.