

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.⁵

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.⁶ 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

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

⁶ In this regard, however, Borga 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.