

International Fragmentation of Production and Globalization

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Many production processes are vertically integrated, consisting of a series of production blocks connected and coordinated by service links. The research that Henryk Kierzkowski and I have undertaken in the past 15 years has concentrated on this phenomenon, and how it is a characteristic of today's pattern of increasing globalization. The work was initially motivated by the desire expressed by many during the Uruguay Round of GATT Negotiations for economists to analyze the role of *services*. The point of departure in our own work was to consider the role that service activities played in connecting production blocks. The idea behind the concept of *international* fragmentation is that outsourcing various production blocks to countries that possessed a comparative advantage in that type of productive activity would lower the marginal costs of producing the final commodity. However, the costs of international service links, in the form of transportation and communication, co-ordination of production networks, knowledge of how to reduce uncertainties, etc, tend to be higher for fragmentation that crosses international borders. These service link activities exhibit, we would argue, rather strong elements of increasing returns, which implies that international fragmentation will only be undertaken once levels of production are sufficiently great. The general growth of world incomes is consistent with greater degrees of trade in what might then appear as intermediate goods, goods in process, or various other "middle products." But more has been happening: The changes in technology currently and in past decades have greatly reduced the costs of such service links as communication and transportation, relatively even more in across borders than within. As well, there has been a reduction in the barriers to service activities, both within countries and between them. All of these changes have conspired to increase the degree of international fragmentation of the production process.

The initial Jones and Kierzkowski article, "The Role of Services in Production and International Trade: A Theoretical Framework," appeared in 1990 in the Jones and Krueger edited volume, *The Political Economy of International Trade*, (Blackwell). Since then there have been several conferences, the volumes of which are just now appearing. Especially noteworthy is the Arndt and Kierzkowski edited volume, *Fragmentation: New Production Patterns in the World Economy*, (Oxford University Press, 2001). Appearing there is the paper that will form the crux of my remarks, "A Framework for Fragmentation," (with Kierzkowski). Part of our focus there concerns the consequences of fragmentation for a country's internal distribution of income. Must unskilled workers lose out when a labor-intensive fragment in a developed country gets outsourced to a less developed country? Other prominent contributions include theoretical papers by Alan Deardorff and also by Richard Harris. Investigations into the situation in Ireland (by Frances Ruane and Holger Gorg), the Far East (Leonard Cheng, Larry Qiu, and Guofu Tan), and Italy (one article by Alberto Petrucci and Beniamino Quintieri and another, on textiles, by Giovanni Graziani) provide country studies, while

Alexander Yeats provides a lengthy, detailed study, “Just How Big is Global Production Sharing?” Of course other economists have been concerned with this phenomenon, even if under different names. Noteworthy in this respect is the piece by Robert Feenstra, “Integration of Trade and Disintegration of Production in the Global Economy,” *The Journal of Economic Perspectives*, Fall, 1998, and Feenstra and Gordon Hanson, “Foreign Investment, Outsourcing and Relative Wages,” (in Feenstra, Grossman and Irwin, eds, *The Political Economy of Trade Policy: Papers in Honor of Jagdish Bhagwati*, MIT Press, 1996).

A recent unpublished paper by Mary Amiti raises the important question concerning agglomeration: In what part of the production process are increasing returns most prominent. Whereas we argue that these are found primarily in service link activities, Prof. Amiti suggests instead that returns are increasing when production takes place in one locale. This is a very important question, but needs to be answered by looking at the data.