

Slicing Up Global Value Chains

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This paper is inspired by the already classical study of the iPod by Dedrick et al. (2010). The iPod is assembled in China from several hundreds of components and parts that are sourced from around the world. This production network is led by Apple, a US-based company, which is estimated to capture between a third and half of an iPod's retail price. Asian firms like Toshiba from Japan and Samsung from South Korea capture another major part as profits from manufacturing high-value components, such as the hard-disk drive, display and memory. In contrast, assembling and testing activities by Chinese workers is estimated to capture no more than two percent. Other studies of tablets, mobile telephones and laptops suggest a similar pattern of specialization: advanced nations deliver capital and high skilled labor, capturing most of the value, while emerging countries contribute low-skilled activities that add little value (see Ali-Yrkkö et al. 2011 for another example on the Nokia N95 smartphone).

Such case studies are mainly conducted for high-end electronics and for one point in time which raises obvious questions about representativity. How pervasive is the process of international production fragmentation for a wider set of products? How does the factor content of these chains change over time when fragmentation deepens? And how do specialization patterns differ between high-income and emerging economies that participate in these chains? In this paper we provide a macro-economic and longitudinal analogy of the iPod exercise, using many countries and many manufacturing products. We "slice up the global value chain" (to borrow the term from Krugman 1995) using a decomposition technique which has recently become feasible due to the development of the World Input-Output Database (Timmer et al, 2014). We trace the value added by all labor and capital that is directly and indirectly needed for the production of final manufacturing goods. The production systems of these goods are highly prone to international fragmentation as many stages can be undertaken in any country with little variation in quality. We seek to establish a series of facts concerning the global fragmentation of production that can serve as a starting point for future analysis. After a short overview of our data and methods, we discuss four major trends. First, international fragmentation, as measured by the foreign value-added content of production, has rapidly increased since the early 1990s when it made its appearance on a global scale (Feenstra 1998). Second, in most global value chains there is a strong shift towards value being added by capital and high-skilled labor, and away from less-skilled labor. This suggests a pervasive process of technological change that is biased towards the use of skilled labor and capital. Third, within global value chains, advanced nations increasingly specialize in activities carried out by high-skilled workers. The direction of this change follows the intuitive notion of comparative advantage driven by relative factor endowments across countries, but the pace at which it occurs has not been established before. Fourth, emerging economies specialize in capital-intensive activities as the capital share in value added is rising while the share of low-skilled labor declines. This surprising finding runs counter the idea of comparative advantage and calls for more sophisticated explanations. Some alternative ideas are discussed in the final part of the paper.



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