

International Fragmentation of Production and Firm Productivity: In Search of Focus Effect

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Non-technical summary

An increasing number of firms contract out business activities to foreign providers in order to cut costs and stay focused on their core capabilities. The objective of the study is to identify and estimate the causal effect of foreign sourcing of intermediate inputs (offshoring) in manufacturing on firm productivity. Despite the attention that offshoring currently demands in the public media, there is still relatively little empirical evidence on its firm-level economic impact. Because the debate has mainly been focused on job relocation aspect of offshoring, most of the existing research on the subject is primarily centred on labour market issues. The impacts on productivity, however, have received only little attention. It is very important to focus the debate and empirical research on the effects of international fragmentation of production on productivity and firm performance because the process provides long-term aggregate economic benefits in the form of increased living standards through lower consumer-good prices, positive productivity effects, faster technological progress, and reductions in production costs.

The study uses a unique firm-level panel data set of Slovenian manufacturing firms operating in the period 1994–2005 with a detailed accounting information and foreign trade data. Using propensity score matching techniques combined with the difference-in-differences approach, the article analyzes whether firms that start importing intermediate inputs become more productive. This is done by comparing performance of the firms that switched from purely domestic to foreign sourcing of intermediate inputs with the performance of similar non-importing firms in the same industry and time period.

The results of the empirical analysis suggest that:

- Firms that source intermediate inputs from abroad are larger in terms of revenues and employment, more capital intensive and more productive than firms sourcing only domestically. The superior performance identified is robust since it relates to absolute terms, relative to industry averages, year-by-year and industry-by-industry.
- There is a strong persistence of import status in time. Among the firms that imported in a given year, 90% of them also imported in next year, while among the firms that did not import in the current year, 71% of them neither imported in the subsequent year. In addition, importers of intermediate inputs have higher chances of survival than non-importers.
- Firm productivity, capital intensity and size are increasing with the share of imported inputs in total material costs. All three characteristics are also uniformly increasing in the number of imported varieties of intermediate inputs. Firms that import more than 100 varieties of inputs are on average almost 20% more productive than the average firm in the same industry. Firm performance is positively associated with the number of import markets: firms that buy intermediates from more than 9 countries are on average more than 15% more productive than an average firm.

- In the periods after the beginning of foreign sourcing of inputs, new importers increase revenue, employment, capital intensity, number of imported varieties, number of import markets, share of foreign inputs in total material costs, and productivity.
- Intermediate goods importing yields positive static and dynamic effects on firm productivity. This finding is robust to different econometric techniques and specifications. In the first year, offshoring brings about a 20% increase in labour productivity and roughly equal growth of total factor productivity.
- Despite the short-lived year-on-year growth rates of productivity in excess of non-importers, cumulative gain in productivity of new importers after four years remains significant at around 37% for labour productivity and 35% for total factor productivity. The evidence also shows that it is not exporting status but imports of intermediate inputs that is driving the productivity growth in new importers.

The findings of the subsequent and ongoing research suggest that offshoring also spurs innovation activity in the firms. Already in the year of import initiation, new importers introduce product innovations with around 7-11% higher rate than non-importing counterparts. The difference between the two groups becomes even larger and more significant in the next two years as the importers are by 11-15% more likely to launch new products on the market. The effect persists as long as four and six years after the switch from domestic to foreign sourcing of intermediate inputs. In contrast to product innovation, process innovation is more common in prospective importers already prior to import start. Firms considering fragmenting their production processes introduce improvements in management and execution of internal processes before the start of foreign sourcing of inputs.

The implications of the results for the companies are several:

- Firms should consider outtasking peripheral processes in which they do not have competitive strengths, but in a way that does not threaten the production process and long-term strategic position. They should also boost their ambitions and reflect on the possibilities that more distant emerging economies have to offer.
- Companies no longer compete on the basis of the assets they own but on the quality of bundling their own and external capabilities and solutions into a product, how far they advance organizational redesign and fine-tuning of the value chain, and how innovative their marketing approach is. In this sense, companies ought to regard offshoring in the sense of reorganizing production value chain and reorganizing governance structures as an important core competence on its own.
- Firms can no longer afford to be jack of all trades so that R&D cooperation has become crucial. Successful buyer-supplier relationships could serve firms to establish resource platform through which technology, knowledge and ideas could be circulated. Each side would then benefit from other partner's expertise and exploit it in its core business.
- Like any other type of internationalization, international production sharing demands a good awareness of the costs and benefits and capable management and human resources to pull

off the project. Where internal resources are inadequate, firms should make use of specialized outsourcing consultancies that could facilitate cross-border vertical fragmentation.

Given that the results of the empirical analysis showed that offshoring of intermediate inputs leads to productivity improvements and that foreign sourcing is a catalyst for product and process innovation, policymakers should avoid imposing restrictions on production relocation and promote further multilateral and regional trade and investment liberalization. Intensification of production fragmentation requires high quality infrastructure, low trade barriers, predictable business environment, strong legal protection and fierce intellectual property rights safeguards. Since globalization will continue to create pressures to reallocate resources across borders, sectors, firms and occupations and since the direction and nature of the changes will be impossible to predict, a successful government responses will include promoting flexibility and adjustment. In the context of the European social model, governments will need to make sure that their safety-net policies for the affected workers do not blur firm's cost of employing workers. In other words, welfare policies should protect workers rather than jobs and should encourage adjustment rather than status quo. In this sense, educational system should be preparing workers for lifetime employability rather than lifetime employment.