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Synchronization of Business Cycles and the Extensive Margin of Trade

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Empirical studies have found that pairs of countries with stronger trade integration have a higher correlation in output growth.[1] One explanation for this finding is that shocks in one economy alter the demand for foreign intermediate products, since intermediate goods constitute 75 percent of worldwide trade. For example, a positive productivity shock in one country generates an increase in domestic output and income and, hence, an increase in the demand for foreign intermediate goods from its trading partner. The increase in the demand for imports increases the output of the country's trading partner, so the business cycles of the two countries become synchronized. Empirically, this synchronization is stronger for pairs of countries that trade more with each other.

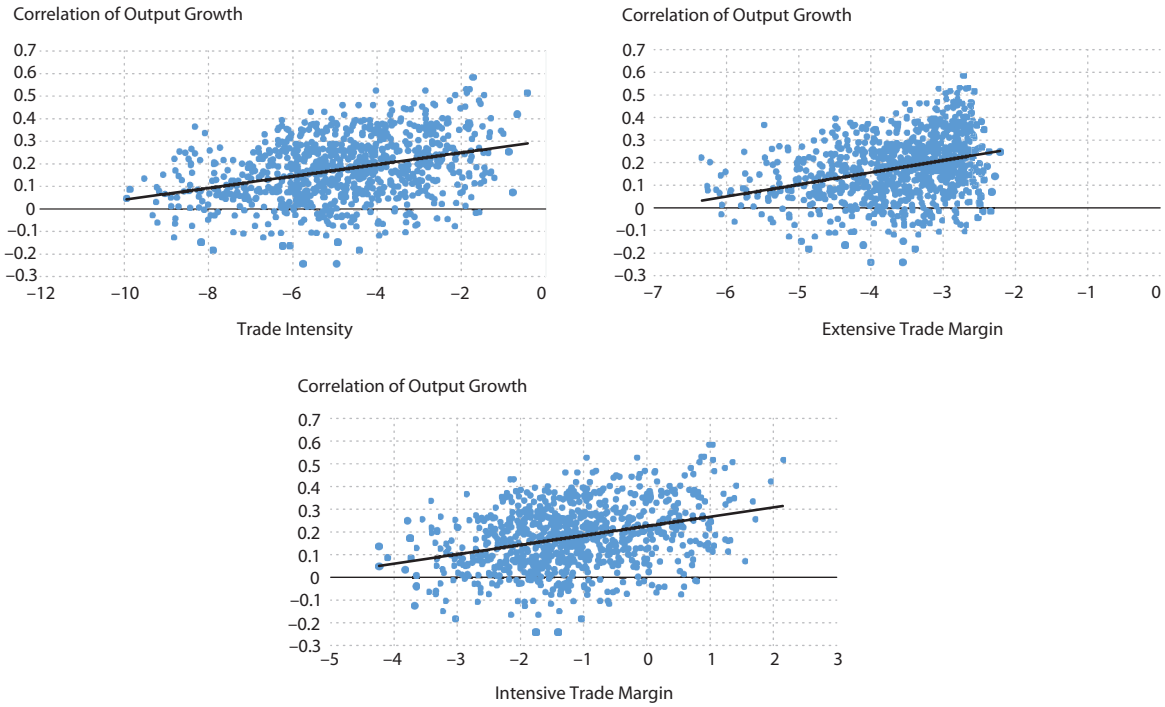
In a recent article, Liao and Santacreu (2015) (i) decompose the volume of trade into the extensive margin (the number of different types of intermediate goods that are traded across countries) and the intensive margin (how much of each good is traded across countries) and (ii) examine which of these margins drives the comovement or synchronization. Their results (see the figure) show two measures of business cycle synchronization—the correlation of output growth and the correlation of aggregate productivity growth between two trading partners—against various measures of international trade (volume of trade, extensive margin of trade, and intensive margin of trade). As the figure shows, there is a positive correlation between both pairwise output growth correlation and international trade (Panel A) and pairwise aggregate productivity correlation and international trade (Panel B). The correlation is between 0.25 and 0.35. That is, countries that trade more with each other at all margins of trade have more highly correlated business cycles in terms of both output and aggregate productivity.

In a statistical analysis, Liao and Santacreu (2015) find that the extensive margin of trade explains most of the trade-output comovement. The intensive margin seems to play only a marginal role. In particular, they find that when the *intensive* margin is held constant, a doubling of the median extensive margin of trade is associated with an increase in the bilateral correlation for both aggregate productivity and output of about 0.06. In contrast, when the *extensive* margin is held constant, a doubling of the median intensive margin of trade is associated with a decrease in the bilateral aggregate productivity correlation of about 0.01 and an increase in the bilateral output correlation of about 0.003. Moreover, these estimates are statistically significant only for the extensive margin of trade.

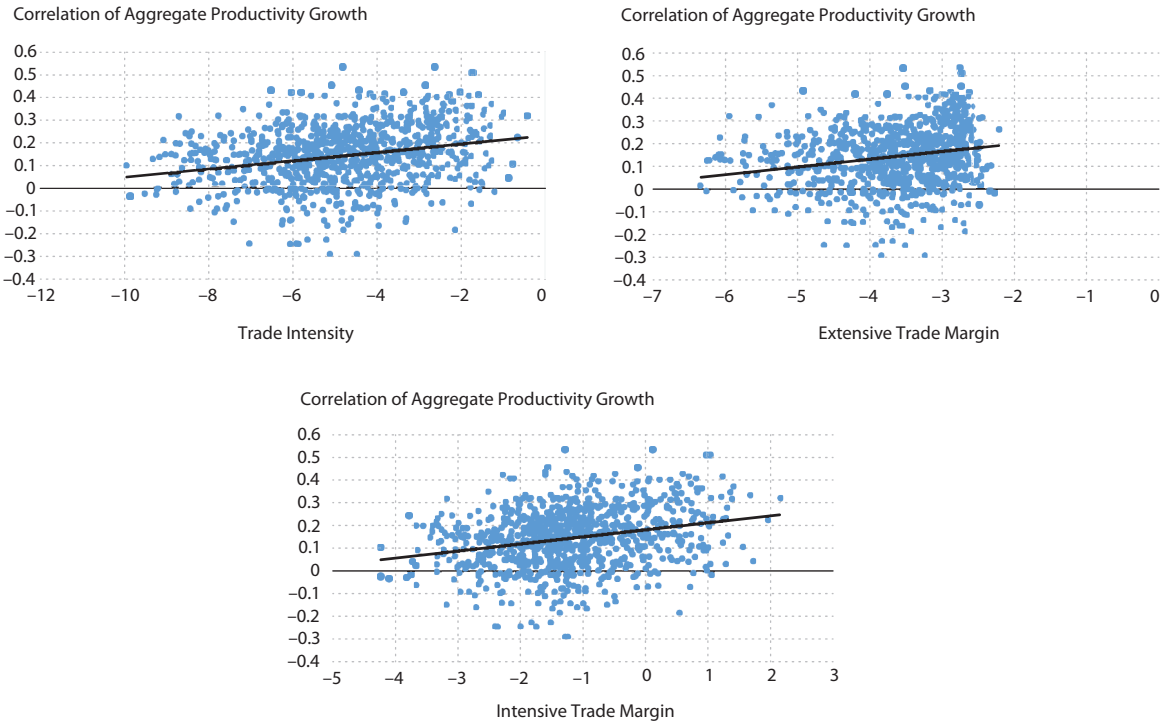
The business cycle is more highly synchronized between countries that trade more differentiated intermediate products with each other.

A striking aspect of these results is that, in isolation, both margins of trade seem to have a positive correlation with the comovement of output growth and aggregate productivity. However, when taken together in the regression analysis, the role of the intensive margin is not as important as the role of the extensive margin. What factors are producing these results? In pairs of countries with more differentiated intermediate goods (i.e., those with a higher extensive margin of trade), shocks are propagated more strongly, which helps to synchronize their business cycles. One explanation is that positive productivity shocks induce the entry of new firms in the domestic economy, which produces and exports new products to the foreign economy. New products increase productivity in both countries, and the comovement is higher for the pairs of countries that trade more goods. The intensive margin plays only a mar-

A. Trade Output Comovement (1985-2005)



B. Trade Aggregate Productivity Comovement (1985-2005)



NOTE: Each dot represents a pair of countries in a sample of 30 countries (Argentina, Australia, Austria, Brazil, Canada, China, Denmark, Germany, Finland, France, Greece, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Korea, Malaysia, the Netherlands, New Zealand, Norway, the Philippines, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States). There are 870 pairs of countries, and I use averages for the period 1985-2005.

ginal role, since productivity is mainly driven by the number of intermediate goods.

The combined results of Liao and Santacreu (2015) suggest the following: (i) Much of the trade-output comovement can be explained by the extensive (but not the intensive) margin of trade. And (ii) the international transmission of shocks through trade in intermediate goods is a plausible explanation for these relationships. ■

NOTE

[1] See Baxter and Kouparitsas (2005), Clark and van Wincoop (2001), Frankel and Rose (1998), and Kose and Yi (2006).

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