

Summary

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The Evolution of Comparative Advantage

Measurement and Implications

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How does technology evolve over time? This question is important in many contexts, most notably in economic growth and international trade. Much of the economic growth literature focuses on absolute technological differences between countries. In the context of the one-sector model common in this literature, technological progress is unambiguously beneficial. Indeed, one reading of the growth literature is that most of the cross-country income differences are accounted for by technology, broadly construed.

By contrast, the Ricardian tradition in international trade emphasizes relative technological differences as the reason for international exchange and gains from trade.

In the presence of multiple industries and comparative advantage, the welfare consequences of technological improvements depend crucially on which sectors experience productivity growth.

For instance, it is well known that when productivity growth is biased towards sectors in which a country has a comparative disadvantage, the country and its trading partners may experience a welfare loss, relative to the alternative under which growth is balanced across sectors. Greater relative technological differences lead to larger gains from trade, and thus welfare could be reduced when countries become more similar to each other.

To fully account for the impact of technological progress on economic outcomes, we must thus understand not only the evolution of average country-level TFP, but also the evolution of relative technology across sectors. Or, in the vocabulary of international trade, it is important to know what happens to both absolute and comparative advantage. Until now the literature has focused almost exclusively on

estimating differences in technology at the country level. This paper examines the evolution of comparative advantage over time and its implications. Using a large-scale industry-level dataset on production and bilateral trade, spanning 72 countries, 19 manufacturing sectors, and 5 decades, we estimate productivity in each country, sector, and decade, and document the changes in comparative advantage between the 1960s and today. We then use these estimates in a multi-sector Ricardian model of production and trade to quantify the implications of changing comparative advantage on global trade patterns and welfare.

Our main results can be summarized as follows. First, we find strong evidence that comparative advantage has become weaker over time. Controlling for the average productivity growth of all sectors in a country, sectors that had a larger initial comparative disadvantage grew systematically faster. This effect is present in all time periods, and is similar in magnitude in both developed and developing countries. The speed of convergence in sectoral productivities implied by the estimates is about 18 % per decade.

Second, weakening comparative advantage is important for understanding the evolution of trade volumes and trade patterns. Had comparative advantage not weakened, trade volumes would be higher, cross-country export patterns more dissimilar, and intra-industry trade lower than they are in the data.

Finally, these changes in comparative advantage had an appreciable welfare impact. In the counterfactual scenario of unchanging comparative advantage, in the 2000s the median country's welfare would be 1.6 % higher than in the baseline. This median welfare impact amounts to nearly 25 % of the median gains from trade relative to autarky implied by the model, which are 6.6 %. Moreover, there is a great deal of variation around this average: the percentage difference between welfare under this counterfactual and the baseline ranges from -1.1 % to +4.3 % among OECD countries, and from -4.6 % to +41.9 % among non-OECD countries. The cross-country dispersion in the welfare impact of changing comparative advantage is similar to the dispersion in the implied gains from trade.

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