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Chapter Author: George von Furstenberg

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Comment

George M. von Furstenberg, *Indiana University*

I. Introduction, Outline, and Making Up for the Lack of Hypothesis Testing

Bergin and Lin pick up a venerable distinction that, poorly represented with disaggregated trade data now accessible, has become the dernier cri of trade theory. The general issue of the new literature is what influences the division into intensive and extensive margin of the growth of a country's share in the global exports going to another country. The specific issue raised in a subset of papers like the one here that is of interest is how, and then why, that division is influenced by the exchange rate regime between pairs of countries.

This comment first conveys the essence of the historical distinction and then shows how the data currently used fail to reflect that distinction. This raises the question of what a contemporary implementation of the classical concept, largely preserved in Bergin and Lin's model but not in its empirical implementation, could imply. It then discusses the absence of substantial uncertainty about future real exchange rates in the model, which detracts from the paper's main theme. Other aspects that are crucial to the industrial organization of cross-border trade, such as foreign direct investment (FDI) and trade in components, also are missing from the model. This makes it difficult to test hypotheses with it or to account for its findings.

One crude validation test could be to check on the growth of trade shares for Canada and Mexico with the United States since the Canada-U.S. Free Trade Agreement 1988 or the NAFTA (North American Free Trade Agreement) 1994 and examine how this growth has been divided between the extensive and intensive margins. My hunch is that the expansion of the bilateral trade shares of these countries is about as large and as concentrated at the extensive margin as Bergin and Lin estimated for

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currency unions sans euroland. But in fact the currencies of all NAFTA countries have been floating against each other, and real exchange rates have swung widely between them since 1994.

II. The Classical Definition of Expanding Trade at Extensive and Intensive Margins

For over 2 centuries, international trade has been rated as beneficial whether expanded at its intensive or extensive margins but for different reasons. The benefits on the intensive margin stem from getting more for producing exportable goods than available in exchange for other goods produced under autarky. Exploiting this margin to raise real income was the subject of the theory of comparative advantage. The extensive margin refers to the benefits of enjoying new goods not produced, and perhaps still too expensive to produce, at home, after the technique for doing so has been learned.

Setting the terms of exchange for such natural monopoly goods poses special challenges. The difficulty is that for them there is no bracket on the equilibrium terms of trade that is created by internal relative production-cost conditions in each of the partner countries, as under incomplete specialization. Classical economists referred to the sagas of the salt, spice, and silk trades, however, to point out that any increase in a unique imported "variety" that a country chooses to enjoy on any terms would have to be at least somewhat beneficial. *Variatio delectat*, though not without limit: we now have theories of habit goods and rational inattention that explain what to fall back on when variety gets bewildering and the choices too many and complex to think through.

Classical economists' discussions of international trade thus invariably emphasized two benefits: (1) increased *abundance* and real income through improvement in the terms of exchange for one's exportable output compared with autarky, and (2) greater *variety* than available under autarky producing hedonic gain.

Adam Smith assigned several different functions to trade, such as providing a vent for "surplus" domestic production and allowing the exploitation of scale economies through specialization since the division of labor was seen as limited by the extent of the market. Yet he chose to emphasize that free trade is essential for the maximum development of wealth for any nation because, through such trade, a variety of goods becomes possible. Ricardo notes that foreign trade "increases the *amount* and *variety* of the objects on which revenue may be expended, and affords, by the *abundance* and *cheapness* of commodities, incentives to

saving, and to the accumulation of capital" (see Ruffin 2002, 741). Being the principal discoverer of the theory of comparative advantage, he thus put more emphasis on benefit 1 than benefit 2. Later theories, such as the Scandinavian theory of comparative advantage that was also based on factor immobility and incomplete specialization as the normal outcome, involved trade as a bringer of variety even less: the production function specific to a good was assumed to be the same in all countries, but factor endowment ratios, and hence the factor content of goods traded, differed between them.

The gist of all the classical distinctions is that "extensive" types of goods involved in the expansion of trade are specially made and hence new, based on technical and taste innovations, or firmly identified with a geographic region that can produce them. Trade in "intensive" goods, by contrast, involves standardized auction-type goods readily available and in continuous and habitual supply from several sources and in general use.

III. Lost in Translation to Canned Data Categories

To implement their search for differential effects of exchange rate regimes at the two margins, Bergin and Lin rely on a system of Standard International Trade Classification (SITC)—a four–digit classification ending in 2000. Adding proportionately more than competing suppliers from other countries to existing exports within a four-digit category would expand trade at the intensive margin; exporting in more categories would boost trade at the extensive margin. To see whether such a definition is economically meaningful requires looking into the content of the statistical categories. All these categories, except for unprocessed foods, live animals, and crude materials, relate to manufactured goods. They do not include services, which now account for two-thirds of personal consumption expenditures and the greatest increase in hedonic variety. Only one of the 10 one-digit SITC categories starting at 0—number 8, Miscellaneous Manufactured Articles—contains a high proportion of finished consumer goods. Lower categories include intermediate and capital goods traded between firms.

The SITC classification scheme does not establish categories that deserve to be called varieties or composite products in a hedonic sense but uses quite different principles of grouping. For example, 8427 is the category for blouses, shirts, and shirt-blouses for women and girls of woven textile fabrics, while 8447 is for the same but of knitted or crocheted textile fabrics. Growth at the extensive margin of trade thus would be

produced by expanding the types of processed fabric used in exported blouses, not by providing a greater range of quality or variety of design. So if a country that previously exported only blouses of woven fabric started to export knitted blouses of the same design and intended for a similar occasion, it would be expanding trade at the extensive margin under Bergin and Lin's measure. If the country instead started also to export blouses of a stunning new design and for different occasions, but still of woven fabric, it would expand trade at the intensive margin. This example shows that whether trade is boosted inside a four-digit category or in different categories depends entirely on the configuration of these boxes and does not relate to any distinguishing consumer or producer economics that I can recognize. Certainly classical economics would be more inclined to credit the design innovation with creating benefits at the extensive margin than at the intensive margin, for it would distinguish between the upscale trade that contributes to variety and the downscale trade in basic, fairly standardized, goods contributing to abundance.

One more example to drive home the point: children's toys is category 8942, and 8947 is sporting goods. Assume that a firm that had specialized in exporting gloves and mittens used in sports (89477) decided to apply its facility in working specialty fabrics to also manufacture outfits and accessories for dragons, dolls, and knights for export. Once again, by entering the toy category in which the country had not exported before, it would expand trade at the extensive margin according to Bergin and Lin's measure. If the firm instead had decided to take up the production of fishing rods (89471), an entirely unrelated new venture, it would have increased trade at the intensive margin since the country was exporting appreciably in the associated four-digit category already before.

Hence, the more one looks into the categories, the less suitable they appear to convey the "classical" or any other predictable economic content or difference that Bergin and Lin are seeking—or simply asserting as if such a relevant difference did not first need to be constructed in the categories they work with. Contrary to what Bergin and Lin presume, many different goods are bunched together in four-digit categories according to noneconomic and incoherent principles of classification. Hence, innovation and augmentation of variety in exports can occur within, as well as between, SITC categories without obvious distinction.

Depending on what theme researchers pursue, they must first obtain a relevant grouping of goods. Grouping criteria might include R&D and factor intensity or might serve to distinguish knowledge goods, IPR-protected goods, ICT goods, design-intensive goods, fashion

goods, goods tied to geographic origin, customized goods, differentiated goods, and standardized goods with ISO number, and so forth. Investigating how various degrees of integration and types of regimes affect the volume and distribution of trade in such goods may prove insightful. For instance, exchange rate regimes could be among the factors that differentially affect the growth of exports by such industry characteristics. If so, this might give a clue to why such regimes matter for the structure of export growth. Such a structured approach would avoid pressing economic interpretations on exports expanding within and between SITC product categories that these categories cannot support.

There are at least three other match-up problems between economic theory and data:

a. Bergin and Lin's model variety refers only to finished consumer goods and their "AL" (a nod to the labor theory of value?) production function does not take in semi-finished inputs or capital. However, the data used are not nearly so exclusive: both France and Germany, for instance, export more capital goods than consumer goods, and the import content of Germany's export goods is 40%. Goods other than consumer goods account for the lion's share of the data and dominate the results, but these are to be understood with a model not containing such goods.

b. Classical economists did not consider fragmentation trade nor do Bergin and Lin. Yet an explosion of such back-and-forth trade inside Europe is likely to register as a big expansion of trade at the extensive margin in the authors' scheme. For the representative consumer in their model, trade in more categories of components could add to variety only to the extent that these components were incorporated in variety-enhancing final products. Fragmentation trade in components is governed by considerations of cost efficiency and greater abundance, not hedonic variety.

c. There is more in the data than appears in the model. Conversely, firms, whose number is endogenously determined in the model, do not appear in the data. Berthou and Fontagné (2008, 15) estimate with French firm data (collected at the HS-8 level) that the market share of the 10% largest exporters was 95% in the period 2000–2003. Hence, if French exports to country N become significant in additional categories, large established firms already exporting in many categories to country N are more likely to be involved than small firms exporting for the first time. By dwelling on set-up costs, Bergin and Lin imply the opposite. Discussions of set-up costs for entering foreign markets also do not distinguish

among those involving preparations in production (e.g., producing with higher productivity and quality), distribution (logistics), and final sales abroad (retail outlets and marketing). Retail giants like Carrefour or Wal-Mart and regional producer cooperatives mediate between the small and the large by scaling up and cutting costs in the latter stages of the export business. Deutsche Bundesbank (2007) estimates that, in 2005, 87.5% of German enterprises with an annual turnover of more than €50 million were directly engaged in the export business but that only 10.5% of those with an annual turnover of less than €10 million were so engaged.

IV. On Their Own Terms

I have gone beyond the Bergin and Lin paper in places. Taking the paper on its own terms, there is more that can move the two margins of export trade than the paper lets on. The operational definition used by Bergin and Lin is to break country J's export (JX) share in global exports (GX) to country N, JXN/GXN, into two factors that are positive and not greater than one. Only one additional variable is used in the denominator and the numerator of these margins: it is that subset of GXN, GX[J]N, that consists of global exports to N in only those categories in which J participates appreciably by some binary criterion. The multiplicative decomposition is

$$\begin{aligned}\text{Export Share} = \text{JXN/GXN} &= (\text{JXN/GX[J]N})\ (\text{GX[J]N/GXN}) \\ &= (\text{Intensive M})(\text{Extensive M}). \qquad (1)\end{aligned}$$

Now any increase in J's share of the value of global exports to N that is due to improvement in the terms of trade in the categories in which J exports to N would (under short-run inelasticity of demand) raise JXN and GX(J)N equiproportionately and by more than GXN. Such a development would be credited mechanically to expansion at the extensive margin, according to formula (1), as GX(J)N rises by a greater percentage than GXN. Also, under pricing-to-market (PTM), exchange-rate depreciation improves the terms of trade. Then, as the exchange rate fluctuates, PTM could produce fluctuations at the extensive margin of trade without signifying anything for "varieties." Since no "new" trade would be involved, clearly these assignments of the export share change to the extensive margin would not correspond to the classical definition at all.

The same applies if country J had maintained its share of exports to country N in all those categories in which it exports to N but total exports in these categories had simply grown faster than in the other categories: Again, JXN would rise at the same rate as GX[J]N, leaving the intensive margin unchanged, while GX[J]N would grow faster than GXN, raising the extensive margin without increasing the number of varieties consumed.

This leaves the case, the only one subsumed in Bergin's discussion, where GX[J]N/GXN rises because country J participates in more categories of global exports to country N. Here difficulties may be created by Viner's trade creation for Bergin and Lin's interpretation. When production of electronics such as home entertainment systems sold in the U.S. market first shifted from the United States to Mexico on account of gains in the competitiveness of using Mexico as an export platform under NAFTA, there was an expansion at the extensive margin of Mexico's export trade with the United States. But variety in the U.S. market did not increase; only costs fell. Trade in standardized components tends to be directed, and quickly redirected, on the basis of cost efficiency alone. Production and trade flows in differentiated products are more entrenched.

V. Lessons from the Failure of Past Predictions and Persistent Exchange Rate Errors

Research on the trade effects of a monetary union that is currently of interest relates predominantly to the euro area. Yet it is already well known that data for currency unions collected by Rose mostly for groups of small and frequently backward countries far away from Europe cannot successfully be projected on euroland. Running regressions with data that are dominated by Equatorial and sub-Saharan countries has produced egregious errors when the regression results were used to predict the effects on the growth of trade within the euro zone. Outside resource-extraction investments, these African countries got little FDI and were not part of a major regional, let alone global, supply chain. Whatever they achieved from a very low starting base under a currency union has no conceivable relevance for the euro zone for lack of comparability of almost all transmission conditions. The euro is a major international currency and the EMU (European Economic and Monetary Union) is a monetary union, not just a currency union. Currency unions based on a minor currency are usually subject to dollarization/euroization in their financial business and trade contracts. They tend to have no pricing

power in international markets, and recurring foreign-exchange shortages (balance of payment [BOP] crises) may well have a strong effect on the extent of their trade with other members of the union. Any resulting real depreciation of the common currency relative to the rest-of-world (ROW) would divert imports from ROW to countries inside the union, thereby strengthening trade between them (cf. Baldwin 2006, 44).

Rose and van Wincoop (2001, 389), managed to whittle Rose's earlier prediction of the trade-creating effect of currency union down to 58% for the euroland members of that time. This was still several times greater than the range of 5%–10% (up to twice as much in the long run) actually found by Baldwin (2006, 48) when he evaluated the evidence that had emerged for the euro zone in the meantime. Simply adding observations for the euro-area countries to the Rose data would yield a blend of two very different effects fitting neither African and other such currency union countries nor the euro zone.

To analyze data on the development of the intensive and extensive margins of trade in the euro zone in fixed physical categories, one should start with data for Europe and not for the Central African Republic (population 4.5 million), neighboring Chad (10 million), or other frequently troubled and financially backward countries. Their names appear in the list of 65 pairs of currency union countries for Bergin and Lin's estimation period 1973–2000. Berthou and Fontagné (2008) and several contributions analyzed in Baldwin (2006) have pointed the way in using European data for Europe's one-of-a-kind experiment. That experiment has created a monetary union over an area of great and diversified trading power, with increasingly integrated banking, finance, and goods and services markets. The technical, regulatory, and legal infrastructure required for such integration is largely in place. Mini–money currency unions in Africa and elsewhere can only contribute sample abnormalities leading to error in predicting the trade consequences of EMU.

There can be no doubt that exchange rate regimes and the economic size and level of development of the area they cover matter for the expansion of trade and the location of FDI (see Ethier 1998). The reason is that these regimes also affect the extent and depth of financial integration and the long-term predictability of real exchange rates among the members of that regime. However, in Bergin and Lin's model, the real exchange rate expected in year t for any future year after t is known and constant as prices are free to adjust to any money supply shocks after 1 year. Modeling each bilateral exchange rate as a deterministic function of the ratio of the corresponding money supplies is a throwback to the

monetarist formulations of the 1970s with puchasing power parity. It provides no room for exchange rate uncertainty per se. Rather, random disturbances in money supplies—which could be neutralized by simply fixing the exchange rate so as to endogenize the money supply of the stabilizing party—in Bergin and Lin's model cause only temporary disturbances of the real exchange rate under for-the-year-ahead price setting if these disturbances are allowed to stand. Even if the government accepts the consequences of stochastic money supply shocks for exchange rates, common inflation targeting "assuming full symmetry across countries" would seem to guarantee a very close approximation to equilibrium when combined with any exchange rate regime in the monetarist model. Indeed, meaningful differences in exchange rate regimes would cease to exist if exchange rates were tethered to relative money stocks as Bergin and Lin specify.

If real exchange rate fluctuations, under floating, were indeed just high-frequency random flurries attributable to a single known cause, that is, loose money supply control, they would average out over time, be easy to hedge in major currencies, and be among the least of worries for business. It is only prolonged deviations of the real exchange rate from what was, and reasonably could have been, expected that causes trouble for decisions to go into foreign markets through either foreign establishment or through developing cross-border trade. By not providing for the risk of real exchange rate deviations correcting only slowly, Bergin and Lin's model does not adequately support the subject matter of his paper, just as the data do not serve to implement his model in other respects. But then who ever said that a fine paper has to get everything right?

Endnote

The author was program director of economics at the National Science Foundation through 2008 when this comment was written, but the views expressed are his own and not those of NSF.

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