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Geographical Diversification of Developing Country Exports

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Summary. — This paper shows that export costs, tariffs, and international transport costs are all robustly associated with geographical export diversification in a sample of 117 developing countries. Reducing each of them by one standard deviation could lead to increases in the number of export destinations of 12%, 3%, and 4%, respectively. From a geographical diversification point of view, trade facilitation at home is an important complement to improving market access abroad. Customs procedures and document preparation in exporting countries have particularly strong effects. Trade costs in general have larger effects in manufacturing, and highly differentiated sectors.

Key words — trade and development, market access, trade facilitation, export diversification, economic geography

1. INTRODUCTION

Developing country trade growth can take place in four dimensions: more trade in goods that existing trading partners already exchange (the intensive margin); introduction of new product varieties (the product extensive margin); an increase in the unit values of traded goods (the quality margin); and creation of trading relationships between new partners (the geographical extensive margin). Although there is a vast literature on the determinants of intensive margin trade growth (e.g., Anderson & Van Wincoop, 2003), and an emerging body of work on the product extensive margin (e.g., Broda & Weinstein, 2006; Hummels & Klenow, 2005) and the quality margin (Baldwin & Harrigan, 2007; Schott, 2004), there is almost no empirical work specifically on the geographical extensive margin. Yet recent findings suggest that growth at the geographical extensive margin—which is akin to the concept of geographical export diversification in the policy literature—can be an important mechanism through which developing countries can become more integrated in the world trading system. For example, Evenett and Venables (2002) report that around 1/3 of developing country export growth over the period 1970–97 was due to the export of "old" goods to new markets. Using a different dataset and methodology, Brenton and Newfarmer (2007) suggest that the proportion was around 18% for the period 1995–04. Although Besedes and Prusa (2007) argue that intensive margin growth may actually be more important than the extensive margin in a dynamic sense, Cadot, Carrère, and Strauss-Kahn (2007) suggest that the relative importance of the intensive and extensive margins depends on the exporting country's income level: the extensive margin is generally more important for poorer countries. Finally, Amurgo-Pacheco and Pierola (2008) find that in terms of the extensive margin itself, geographical expansion dominates product-dimension expansion in poorer countries.

The current financial crisis and trade collapse provide an additional rationale for diversifying exports geographically. Although all major markets have been affected by the "Great Recession," the depth of the resulting drop in demand, as well as the timing and rate of recovery, differs noticeably across markets. Imperfect correlation among major market demand shocks means that developing country exporters serving a wider range of overseas markets may be less affected by overseas recessions than those serving a small number of markets. The argument is, of course, stronger for more "standard" recessions, in which the correlation across major markets is usually substantially weaker than in the present case. Geographical diversification can act like a form of portfolio diversification for developing country exporters, helping to minimize risk for a given level of return (Brainard & Cooper, 1965). This leads to a more stable flow of export income, in addition to other gains such as learning about foreign market conditions and technologies through exporting.

The focus of this paper is on the instruments available to developing country policymakers concerned with supporting geographical export diversification. It aims to fill the void that currently exists in relation to the determinants of trade growth at the geographical extensive margin by examining the impact of three sets of factors: market size and development level in the exporting country; international trade costs (distance, tariffs) facing the exporting country; and export costs (border formalities, customs, documentation, and inland transport) in the exporting country. In line with the broader literature on the determinants of trade growth, I find evidence that the first set of factors impacts the geographical extensive margin positively, but the remaining factors have a negative impact. Moreover, improved trade facilitation—that is, lower export costs at home—has the potential to increase geographical diversification more strongly than comparable changes in market access abroad or international transport costs.

These results are highly robust to estimation using disaggregated data (by exporting country 2-digit ISIC sector) and aggregate data (by exporting country, summing over sectors), inclusion of a wide range of additional control variables, and estimation *via* instrumental variables techniques. I also find evidence that the effect of export costs is stronger in

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manufacturing compared with primary industry, and within manufacturing is stronger for relatively differentiated goods. In policy terms, these results are particularly relevant to lower income countries engaged in industrialization, that is, a shift towards increasingly differentiated manufactured goods, and away from primary industry.

What is the economic intuition behind these results? Recent advances in trade theory provide a powerful explanation for why countries export goods to some overseas markets but not others. According to recent models in which firms are heterogeneous in productivity of which Melitz (2003) is the canonical version, only a relatively small proportion of firms in an economy export. The rest serve the domestic market only. The set of foreign markets entered by exporters is determined by the entry costs they face, which can vary across countries. Only the most productive firms can enter the most costly (least accessible) foreign markets. The existence of a bilateral trading relationship at the country level therefore depends on whether or not there is at least one firm with sufficiently high productivity (low marginal cost) to export profitably to a given foreign market. Factors that shift the equilibrium cost cutoff for a given country pair upwards can thereby increase the probability that bilateral trade is observed between that country pair. Aggregating these effects makes it possible to analyze the process in terms of the set of foreign markets entered, rather than individual bilateral trading relationships. An expansion in the set of markets entered is the process of trade growth at the geographical extensive margin that is central to this paper. Theory suggests that the range of factors that can shift cost cutoffs and thus influence this process can include trade costs, market size, and technology. I find support for these predictions in the data.

The results of this paper complement those of Evenett *et al.* (2002) and Eaton, Kortum, and Kramarz (2008), the two main previous contributions to deal explicitly with trade growth at the geographical extensive margin.[1] Evenett *et al.* (2002) examine the export growth of 23 developing countries to 93 foreign markets over the period 1970–97. Conducting logit regressions separately for each SITC 3-digit product and country pair, they find that the probability of exporting to a given destination is generally decreasing in distance, but increasing in market size. Exporting to proximate markets is found to be a significant predictor of geographical diversification, which the authors argue could be consistent with learning effects. They also find some evidence that a common border and common language increase the probability of observing trade for a given country dyad.

There are two main differences between this paper and that of Evenett *et al.* (2002). First, this paper includes a range of policy-related trade costs, in addition to distance as a proxy for international transport costs. As a result, it has potentially wider implications for trade and development policy. Second, the analytical approach of this paper focuses on the set of overseas markets served by a given exporting country, rather than the existence or not of a particular bilateral trading relationship at the product line level. Results from this single-equation, pseudo-panel estimation framework are thus much easier to interpret than the 4,000 sets of parameter estimates reported by Evenett *et al.* (2002).

Eaton *et al.* (2008) use a database of French firms to analyze the determinants of export behavior. They find that bigger firms (i.e., those with higher levels of sales in France) tend to export to a larger number of foreign markets. By the same token, larger foreign markets tend to attract more entry by French firms. In counterfactual simulations, they show that lowering traditional (variable cost) trade barriers increases exports primarily at the intensive margin, but that lowering (fixed cost) entry barriers produces a large effect at the extensive margin, as more French firms enter each foreign market. (Using similar data, Koenig, 2009 finds that distance—a proxy for trade costs—and foreign market size have significant effects at the extensive margin.)

This paper builds on these firm-level results into two ways. First, it uses a theoretical framework with similar foundations but aggregates it to the country level, so that it is possible to use a global database to test the model's predictions; the analysis of Eaton *et al.* (2008) is at the firm level and is limited to a single country (France). Second, this paper introduces a range of trade cost factors that are of interest from a policy perspective. Since these factors vary substantially across countries but not within, a global framework is needed to examine theoretical predictions as to the impact of trade costs on geographical diversification.

The paper proceeds as follows. In Section 2, I set out the hypotheses to be tested in the remainder of the paper, and motivate them by reference to recent theoretical work. Section 3 presents the dataset, empirical model, and results. Section 4 concludes and discusses policy implications as well as directions for future research.

2. THEORETICAL MOTIVATION

This section motivates the empirical work in the remainder of the paper by relating it to a class of trade models with heterogeneous firms and market-specific trade costs. Whereas the first generation of trade models with product differentiation relied on an analysis using a single, representative firm (e.g., Krugman, 1979), the new class of models following Melitz (2003) and Chaney (2008) allowed for each firm in the economy to have a different level of productivity. These new models provide an explicit theoretical basis for the extensive margin of trade in the geographical and product dimensions.

I do not set out a full model here, but rely instead on existing theoretical results due to Helpman *et al.* (2008). The comparative statics of their model's equilibrium suggest that trade expansion at the new markets margin should depend on fixed and variable trade costs, the size of the exporting country's home market, and the exporting country's technology level. In the remainder of this section, I develop the intuition behind these results, which I demonstrate more formally in the Appendix.

The model in Helpman *et al.* (2008) assumes a world of J countries. Although the analysis takes place using a representative sector, all results are easily generalized to a multi-sector framework by including additional sectors multiplicatively in the utility function (see Chaney, 2008 for an example). Identical consumers in each country have Dixit-Stiglitz preferences over a continuum of varieties with intra-sectoral elasticity of substitution ε. On the production side, each firm produces a unit of its distinct variety using inputs costing $c_j a$, where c_j is a country-level index of factor prices, and a is an inverse measure of firm productivity. Since higher c_j means a more expensive input bundle, it can be seen as an inverse index of country productivity or technology. The interaction between c_j and a means that a can be interpreted as a within-country index of relative firm-level productivity. In addition to standard iceberg costs τ_{ij} affecting exports from country j to country i, firms must also pay a fixed cost $c_j f_{ij}$ associated with each bilateral route. When selling in the domestic market, $\tau_{jj} = 1$ and $f_{jj} = 0$.

Firms are heterogeneous in terms of productivity, with a drawn randomly from a truncated Pareto distribution with