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Export diversification: How much does the choice of the trading partner matter?☆

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ABSTRACT

This paper studies how a country's export diversification varies across destination markets. It develops an extension of the Romalis (2004) model which yields two testable predictions. According to the first, exports between similarly endowed countries ("South–South" and "North–North") are more diversified than exports between differently endowed countries ("South–North" and "North–South"). The second implication is that, for given countries' production patterns, low bilateral trade costs lead to greater export diversification. These predictions find empirical support in a panel of 102 trade partners and 4998 HS-6 industries over the period 1995–2007. Results show that similarities between trading partners in physical capital, land and human capital endowments per worker are associated with more diversified bilateral exports. Exports are also more diversified when bilateral trade costs are relatively low.

1. Introduction

This paper studies, both theoretically and empirically, the potential diversification of exports that could be expected from increased trade between developing (i.e. Southern) countries. In the first part, determinants of the diversification of bilateral exports are studied in an extended version of the North–South trade model of Romalis (2004) in which differences in factor endowments and intra-industry trade in differentiated products determine the pattern of exports along a continuum of goods. In this extended version, barriers to trade differ within and across regions and factor price equalization does not hold so that the commodity structure of trade is fully determined and varies across destinations. The model yields two testable predictions. First, export diversification is greater between similarly endowed partners (South–South or North–North) than between differently endowed partners (the South and the North) (Proposition 1). Secondly, for a given production pattern of countries, a decrease in transport costs between partners increases the bilateral diversification (Proposition 2). In the second part of the paper, I use highly disaggregated trade data for a sample of 102 countries and show that Propositions 1 and 2 find substantial support empirically. For example, Hungarian exports to the market of a similarly endowed country like Romania are more diversified than exports to the equally distant Austrian market. Country pairs with low trade costs (e.g. geographically close and involved in trade agreements) also have more diversified bilateral exports. For example, Mexican exports are more diversified in the Canadian market than in the more distant Chinese market.

In the model, the diversification of bilateral exports depends on the association between the exporting country's comparative advantage and the relative toughness of the competition in the importer's market. A country's export diversification is greater in a market the less this country exports relatively in its comparative advantage and, in the presence of identical trade costs between countries, the competition in markets is relatively high in the importer's comparative advantage (Davis and Weinstein, 1997; Lai and Zhu, 2007). As a result, bilateral diversification is greater when trading partners are similar in terms of comparative advantage. Countries only differ in their factor endowments. The South is better endowed in unskilled labor and has a comparative advantage in low-skill intensive goods. Exports of Southern countries are therefore higher in high-skill intensive goods and lower in low-skill goods in the markets of other Southern countries than in Northern markets (and vice versa for Northern exports). It follows that bilateral diversification is higher between partners with similar factor endowments. Extending the model to allow for different transport costs between and within regions and examining bilateral exports in partial equilibrium, i.e. for constant countries' production patterns, yields the second Proposition. Proposition 2 establishes that lower transport costs between partners increase their bilateral diversification. The better access of the exporter decreases relatively more the competition in its comparative disadvantage in the importer's market.

☆ Appendices A and B at the end of the paper give proofs for theoretical propositions, data sources and a summary of selected robustness checks. Appendices C to J, which fully develop the model and provide further robustness checks, are not published but are available in the discussion paper version at: http://www.unige.ch/ses/ecopo/wps/11104.pdf. This study was supported by Switzerland's SNF through NCCR work package 6.

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I find strong support for the model's predictions in a panel of 9826 pairs of countries (102 importer and exporter countries) and 4998 HS6-digit sectors over the period 1995–2007. I study the impact on bilateral diversification of endowment differences between trading partners of physical capital, human capital and arable land per worker. The effects of trade costs are tested by introducing variables capturing transport costs and trade integration. The results are in line with the theoretical predictions of Propositions 1 and 2 and significant quantitatively. I find that if China were to increase its physical capital to the level of South Korea, its exports to South Korea would be more diversified than Japanese exports to South Korea. Bilateral trade costs also impact significantly export diversification. According to the findings, raising the depth of trade integration between Tanzania and Zambia to the level of trade integration between France and Germany would substantially increase their bilateral export diversification.

In this paper, the pattern of trade and of comparative advantage of Southern and Northern countries is only based on factor endowment differences, as in Romalis (2004). To explore the sensitivity of results to the underlying trade model, I also analyze export diversification in models with firm heterogeneity in productivity within sectors (e.g. Bernard et al. 2007)[1] and in models which introduce differences in sectoral productivities between countries in addition to endowment differences in the determination of countries' comparative advantage (e.g. Burstein and Vogel, 2011)[2]. I also discuss the determination of diversification from the demand side, i.e. in models with non-homothetic demand structure and monopolistic competition (Fajgelbaum et al., 2011; Fieler, 2011)[3]. Empirically, I show that results are robust to the introduction of per capita GDP differences and to the introduction of total factor productivity differences that capture respectively the impact of preference-based and productivity-based comparative advantage differences. Coefficients on these variables have the impact expected from theory, i.e. income similarities decrease the diversification while similarities of total factor productivity strengthen it. However, these factors do not put into question the predominance of factor endowments in the determination of the pattern of diversification between Southern and Northern countries. This is in line with the findings of a large literature comparing the impact of differences of factor endowments, of sectoral productivities and of consumers' preferences on the pattern of bilateral trade (Morrow, 2010; Lai and Zhu, 2007; Debaere, 2003; Gourdon, 2009).

This paper belongs to the body of research on the various aspects of trade patterns of developing countries that has emerged recently with the availability of disaggregated trade data. One strand of this literature emphasizes the importance of the content of exports on overall country performance in terms of economic growth (Hausmann et al. 2007). Another focuses on the determinants of export diversification as countries develop (e.g., Cadot et al. 2011; Imbs and Wacziarg, 2003) and shows its importance in decreasing countries' vulnerability to external shocks and promoting growth (Loayza and Raddatz, 2007; Haddad et al., 2010; Di Giovanni and Levchenko, 2009, 2010). From these latter studies, export concentration combined with specialization in primary commodities comes out as the major factors which impede developing countries from benefiting from trade and reaching sustainable growth. Despite its importance, export diversification has mainly been studied empirically, but not clearly determined theoretically. Moreover, while the current context of regional trade integration raises the need to understand the potential benefits of an intensification of trade between Southern countries, little attention has been paid to analyzing the effect of the choice of trading partners on the pattern of exports. This paper contributes to fill these gaps by showing theoretically and empirically the link between the destination pattern of exports and the diversification.

This paper is close to the literature on the extensive margin of bilateral trade in gravity models which documents the effect of trade costs on the diversity of products exported bilaterally (e.g. Helpman et al. 2008; Amurgo-Pacheco and Pierola, 2008; Sanguinetti et al. 2004; Dennis and Shepherd, 2011). Product diversity in these papers varies between destinations because the presence of fixed export costs limits the number of firms which find it profitable to sell their goods across markets. My contribution with regard to this literature is as follows. First I examine diversification more generally, i.e. according to the relative share of goods in exports whereas these papers focus on the number of bilaterally exported goods. To do this, I use a model that assumes no fixed export costs. However, it can be shown that adding fixed export costs to my model gives similar determinants as this literature for the number of bilaterally exported goods.[4] Second, my model has many sectors which differ in skill intensity and thus is able to show the role of countries' comparative advantage on diversification. Third, the role of relative transport costs on diversification is highlighted, not only as an impediment for bilateral trade flows but also as a determinant of the relative competition faced by exporters across goods in importers' markets. Finally, though it focuses on export diversification, my framework also yields predictions relating intra-industry trade to endowment differences between countries (Helpman and Krugman, 1985; Bergstrand, 1990; Hummels and Levinsohn, 1995; Rice et al., 2003; Song and Sohn, 2012).

The rest of the paper is organized as follows. Section 2 develops the model and studies the theoretical determinants of the diversification of bilateral exports. Section 3 presents the data, describes the sample, and discusses the results from testing both Propositions 1 and 2 on a panel of 102 trading partners (80 developing countries) between 1995 and 2007. Robustness is discussed in the text with detailed results reported in appendices. Section 4 provides my main conclusions.

2. Diversification of bilateral exports in a North–South model

2.1. The model

The world is symmetric, with M countries in the North and M countries in the South. There are two factors of production, skilled and unskilled labor. The proportion of skilled labor is relatively higher in the North ($h_N > h_S$). Following Dornbush, Fisher and Samuelson (1980), these factors are employed in a continuum of industries $0 < z < 1$ that are ranked in increasing order according to their skilled-labor intensity. There is monopolistic competition in each industry. Production technology and fixed costs of production are assumed to be identical across firms irrespective of the region to which they belong and firms are homogenous in productivity within each industry z. In the industry z of a Southern (Northern) country, each one of the n_S (n_N) firms supplies a different variety and sets the same ex-factory price p_S (p_N). The number of varieties of good z in the world is given by: $N(z) = M \cdot n_S(z) + M \cdot n_N(z)$. Technology is represented by a total cost function (TC) and is assumed to be Cobb–Douglas in both factors and identical in all countries:

$$TC\left(q^S(z,k)\right) = \left(\alpha + q^S(z,k)\right)\left(w^s\right)^z\left(w^u\right)^{1-z}.$$

[1] The recent literature which incorporates firm heterogeneity in two-sector models with factor endowments and monopolistic competition shows that patterns of comparative advantage are not affected by firm heterogeneity in productivity (Bernard et al. 2007; Burstein and Vogel, 2011). Moreover, it shows that when firms enter and exit according to their productivity within sectors, this enhances the effect of differences of endowments on the commodity structure of trade. With firm heterogeneity, the main predictions of this paper remain unchanged except that the effects of endowment differences and transport costs on diversification would be magnified. I show in Appendix D that the predictions of this paper hold in the model of Bernard et al. (2007).

[2] See Appendix F.

[3] This literature introduces monopolistic competition in models with non-homothetic preferences and transport costs and shows that countries with similar incomes tend to trade goods of similar quality. In those models, countries have a comparative advantage in goods preferred by domestic consumers and high income countries' demand is higher for high quality goods. It results that income differences between countries could impact positively bilateral diversification.

[4] See Appendix E.