ASYMMETRIC EFFECTS OF FINANCIAL DEVELOPMENT ON SOUTH-SOUTH AND SOUTH-NORTH TRADE: PANEL DATA EVIDENCE FROM EMERGING MARKETS*

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Abstract

Using bilateral trade data in total and technology-and-skill-intensive manufactures for 28 developing countries that account for 82% of all developing country manufactures exports between 1978 and 2005, the paper explores the effects of financial development on South-South and South-North trade. The empirical results using panel regressions and comprehensive sensitivity tests suggest that financial development in the South has a statistically and economically significant South-South and South-North trade increasing effect in manufactures and technology-and-skill-intensive manufactures. However, the positive effect of financial development is found to be asymmetric that favors South-South more than South-North trade.

JEL Classification Codes: F14, F15, G10, O16, O54

Keywords: South-South and South-North Trade, Financial Development, Industrial Development

I. Introduction

In recent years a growing body of research has pointed out the level of financial development as a source of comparative advantage in international trade (Kletzer and Bardhan, 1987; Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Beck, 2002, 2003; Svaleryd and Vlachos, 2005). Accordingly, industries and sectors that are more dependent on external finance are shown to grow faster in countries with better developed financial systems. In particular, developing countries (the South) with low levels of financial development are found to have lower export shares and trade balances in industries (such as manufactures) that depend more on external finance (Beck, 2003). Given that industries with higher external finance needs also have larger scales, higher research and development (R&D), higher working capital and value-added in production (Kletzer and Bardhan, 1987; Rajan and Singales, 1998; Beck, 2002; Braun and Larrain, 2005), these findings have significant implications for development and long term growth in the South. Nevertheless, previous studies on the relationship between financial development and export structure have not differentiated the direction of trade within and between developing and developed countries. In this respect, there is also limited research analyzing the potential effects of financial development on the choice of technology, especially with regard to high value added manufacturing sectors in developing countries.

Furthermore, despite the radical increase in trade and cooperation among developing countries during the 1990s, the existing empirical work on the South-South (S-S) trade is quite limited with only few studies examining its structure and determinants. The lack of academic interest in the determinants of S-S trade including the role of financial development is especially surprising given the recent increase in S-S trade volume as well as the initiatives by developing countries to increase their levels of financial cooperation through UNCTAD or such regional organizations as the South Bank for trade and investment (UNCTAD, 2005b, 2007). The current

paper, therefore, expands the previous research from a S-S and South-North (S-N) perspective by exploring the effects of financial development on the pattern (i.e. manufactures and technology-and-skill-intensive manufactures) and direction (i.e. S-S versus S-N) of developing country exports. In what follows the financial development is measured by two variables that are: i) credit to private sector by deposit money banks and other financial intermediaries (*Finance*), and ii) liquid liabilities (*M3*), both as a share of GDP.

The empirical results using a panel of 28 countries between 1978 and 2005 (that respectively account for 82% and 85% of all developing country total and technology-and-skill-intensive manufactures exports) suggest that financial development has a statistically and economically significant positive effect on the shares of manufactures exports in S-S and S-N trade. Accordingly, a 10% increase in *Finance* (*M3*) increases the share of manufactures exports to the North and the South in GDP in the range of 5.6 - 8.0% (7.3 – 12.3%) and 7.4 – 10.9% (9.7 – 14.3%) respectively. Likewise, we also find a significantly positive and, compared to total manufactures, economically stronger effect of financial development on the share of technology-and-skill-intensive manufactures in S-S and S-N trade. Accordingly, a 10% increase in *Finance* (*M3*) increases the shares of technology-and-skill-intensive manufactures exports to the North and the South in GDP in the range of 7.4% – 8.9% (9.4 – 14.9%) and 8.4 – 12.1% (11.8 – 16.3%) respectively. As a result, financial development is not only significantly increasing Southern total, and technology-and-skill-intensive manufactures exports, but also is doing so in an asymmetrical way favoring exports to the South more than to the North.

The paper proceeds as follows: Section two reviews the previous research on financial development, comparative advantage, and S-S trade. Section 3 introduces the hypotheses, methodology, and the data. Section 4 presents the results. Section 5 concludes.

II. Literature Review

A. Financial Development, Pattern of Specialization and S-S Trade

Capital market imperfections and financial constraints are known to affect firm level fluctuations in employment (Sharpe, 1994), inventories (Kashyap et al., 1994), investment (Fazzari et al., 1988), sales and short-term borrowing (Bernanke et al., 1996), and firm debt and balance-sheets (Krugman, 1999). In addition, the negative effect of recessions on industrial growth is found to be increasing with the degree of external finance dependence and financial frictions (Braun and Larrain, 2005). Financial development is also shown to positively affect the level of R&D (Carlin and Mayer, 1999), and economic growth (Levine et al., 2000)[1].

Recently, there has also been a growing interest exploring the effects of financial development on the pattern of specialization in international trade. The Heckscher-Ohlin model predicts the factor endowment to be a determinant of trade patterns. In this respect Kletzer and Bardhan (1987), building on the Heckscher-Ohlin model, is the first study providing a theoretical framework where credit market imperfections (when credit for working capital or trade finances are needed to pay for the cost of inputs before the receipt of output revenues) can lead to different comparative costs even with identical technologies and endowments (which, hitherto, has been a central theme in the North-South trade literature[2]). Empirically, a growing number of research confirms the uneven effect of financial development on industrial and sectoral growth depending on external credit dependence for investment financing. Rajan and Zingales (1998) and Demirguc-Kunt and Maksimovic (1998) show that industries that are more dependent on external finance grow faster in countries with better developed financial systems. Similarly, Svaleryd and Vlachos (2005) in OECD countries and Beck (2002) in 65 countries for manufacturing industries, Beck (2003) with 36 industries in 56 countries, and Hur et. al (2006)

with 27 industries in 42 countries find that level of financial development determines the pattern of trade specialization. Accordingly, those countries with lower levels of financial development have a lower share of exports in industries with higher external finance dependence. In addition, financial development also determines the degree of credit availability for international trade. Particularly, the lack of developed financial systems both increases the transaction costs and functions as a trade barrier if none of the trading parties can provide the trade financing (UNCTAD, 2005a, 2007).

Consequently, the level of financial development is of significant importance for developing countries. Since "not all goods are alike in terms of their consequences for economic performance", the structure of trade matters for economic development and growth (Hausmann et al., 2007:1). In particular, exports in high-technology intensive industries are likely to generate larger spillovers (such as innovation and accumulation of physical and human capital) and linkages for development than lower technology and labor intensive ones (Feder 1983; Hausman et al., 2007).[3] An and Iyigun (2004), for example, using a panel of 86 countries find that higher export content of skill-intensive goods generates higher per-capita GDP growth rates. Furthermore, Antweiler and Trefler (2002) point out the importance of scale economies for understanding the factor content of trade resulting from industry-level externalities. Moreover, Hausmann et al. (2007) for a large panel of countries and covering over 5,000 products show that countries that export more sophisticated goods with higher productivity levels also grow faster. Imbs and Wacziarg (2003) also examine the patterns of sectoral concentration within and across countries and find that (up to a threshold level of income) economic development is accompanied by increasing diversification of production rather than specialization.

Given that two thirds of developing countries depend on primary commodities with low value-added and small development potential for more than 50% of their export earnings (UNCTAD, 2005a), the question is "why do some economies find it easier to diversify from traditional to nontraditional products and keep the progression rolling along?" (Rodrik, 2004:9). Indeed, firms in developing countries seeking to engage in the production and export of manufactures face various obstacles and our focus in this paper is on one such constraint that is the level of financial sector development.[4]

We can illustrate the link between financial development and comparative advantage using a simple application of a two-country/two-sector Ricardian trade model (Beck, 2003). Assuming that primary goods exhibit constant returns to scale while manufacturing goods enjoy increasing returns to scale, the manufacturing sectors lose more from a lack of external financing. Accordingly, while primary goods sectors can continue to produce with an existing technology, the manufacturing sectors need working capital to acquire new technology (every period before the output is produced) whose cost increases with its quality. Therefore, holding everything else equal, both the Kletzer and Bardhan's Heckscher-Ohlin model and the Ricardian version here predict that countries with better financial systems will have a comparative advantage in industries with higher external finance dependence (i.e. manufactures).

However, considering a three country model, one in the North and two in the South, the level of financial development may have heterogeneous effects on the pattern and direction of trade. Accordingly, suppose that country 1 is in the North with a perfect capital market, and country 2 and 3 are in the South with similar but imperfect capital markets. While country 1 will have a comparative advantage in the manufactures exports (and in particular, high value added manufactures), country 2 and 3 will specialize in primary goods and simple manufactures with

low external finance dependence. Given this pattern, even if country 2 and 3 improve their levels of financial development, they will still be at a disadvantage as long as those levels are behind that of country 1. In contrast, when trading with each other, neither country 2 nor 3 have a comparative advantage in financial development. Moreover, any improvement in the financial system is likely to have a larger marginal effect on the manufacturing sectors and their trade shares between country 2 and 3 than with country 1. For example, assume that country 1 is the high income OECD (the North) and country 2 and 3 are Colombia and India (the South). We would then predict that country 2 and 3, with an average share of credit to the private sector in GDP of 28% and 25% respectively (between 1978-2005), should export less in manufactures (especially in high value added manufactures that are more external finance dependent) to the North that has an average share of credit in GDP of 139% than to the South. Looking at the stylized facts, we see that the average shares of technology-and-skill-intensive manufactures exports (the definition of which is given in the next section) in GDP of Colombia and India were 0.4% each for Northern exports as opposed to 0.9% and 0.7% for Southern exports between 1978-2005 respectively.

B. South-South Trade and Development

S-S trade has long been pointed out as an untapped potential for developing countries. Myrdal (1956), for example, argues that regional integration in the South helps developing countries overcome local market size limitations during industrialization period. Given that output expansion in international trade is shown to be strongly skill biased (Antweiler and Trefler, 2002), increasing market size may help developing countries enjoy scale effects and increase the skill content of their exports. Likewise, Lewis (1980) and more recently UNCTAD (2005a) also suggest that S-S trade can reduce the dependence of the South on Northern growth. Furthermore,

the structure of S-S trade is argued to have dynamic and long term benefits for developing countries due to its comparatively higher technology and human capital intensive factor content (Amsden, 1980; Havrylyshyn, 1985; Lall and Ghosh, 1989). Besides, similarity in production pattern and resource base may facilitate appropriate technology transfer among Southern countries (UNIDO, 2005; Amsden, 1983; World Bank, 2006).

Nevertheless, it is only since 1990s that the S-S trade has become a substantial force in world trade. Between 1978 and 2005 the share of the South in world manufactures exports increased from 5% to 36% while that of S-S manufactures exports reached 16% from a mere 2% during the same period (with an annual growth rate of 8%) (Figure 1). By 2003, manufactures accounted for over two thirds of S-S merchandise exports compared to 25% in 1965 (UNCTAD, 2005a). Furthermore, as of 2005 45% and 48% of developing country manufactures and technology-and-skill-intensive manufactures exports were sent to other developing countries (Table 1). Even more impressive has been the increasing Southern share of technology-and-skill-intensive manufactures in world exports that reached 35% in 2005 from 2% in 1978 with an average annual growth rate of 10%. Similarly, the S-S technology-and-skill-intensive manufactures as a share of world exports grew at an annual rate of 11% reaching 17% of world trade in 2005 from 1% in 1978 (Figure 1). In fact, "five out of the top ten products in S-S trade are high-technology manufactures" (UNIDO, 2005: 18). Also in our sample of 28 developing countries, the median share of technology-and-skill-intensive goods in total manufactures exports is almost twice higher for exports to the South than to the North for most of the period analyzed (Table 1).

<Insert Figure 1 Here>

<Insert Table 1 Here>

Realizing the importance of finance for trade, developing countries have started initiatives to increase the level of financial development and cooperation among themselves such as the South Bank initiative among South American countries. Furthermore, World Bank recently reported a radical increase in South-South syndicated and cross border bank lending and FDI flows in financial and non-financial sectors. The share of S-S FDI as a share of world FDI flows, for example, increased from 16% in 1995 to 37% in 2003 (World Bank, 2006).

Nevertheless, despite its remarkable growth and its increasingly industrialized nature (Table 1), the S-S trade accounts for only 16% of global trade in manufactures compared to 50% for N-N and 34% for S-N trade (UNCTAD, 2005a, COMTRADE). Moreover, as a share of Southern manufactures exports, S-S trade was 45% in 2005 compared to 74% for N-N trade (UNCTAD, 2005a, and Table 1). Besides, the distribution of this trade is highly skewed (as our sample shows) and is mostly driven by few developing countries. In addition, triangular trade (mostly within East Asia) whose ultimate destination is the North is likely to account for a portion of such trade (UNCTAD, 2005a). At this point, in addition to lack of financial sector development, there are also other obstacles that impede S-S trade. First, average tariffs in the South are higher on other developing country exports than those on developed countries. Second, significant infrastructural deficiencies such as inadequate insurance and transportation facilities (that may also be correlated with the level of financial development) continue to prevail.

III. Empirical Analysis

A. The Econometric Model

The key hypotheses of interest are as follows: i) Lack of financial sector development is a major determinant of both S-S and S-N trade and is a significant source of undertrading among Southern countries. ii) Financial sector development may affect the pattern of S-S trade

differently than S-N trade. Accordingly, we explore the differential impacts of financial sector development on S-S and S-N trade. Following Beck (2002) the empirical specification we adopt is as follows:

$$Manufactures_{it} = \alpha_1 Finance_{it-1} + \alpha_2 V_{it} + d_i + d_t + \varepsilon_{it} \quad (1)$$

$$Skilled_{it} = \beta_1 Finance_{it-1} + \beta_2 V_{it} + d_i + d_t + \phi_{it} \quad (2)$$

where *i=1, …, 28* and *t=1978,…, 2005* respectively refer to the country and time period, d_i and d_t is a vector of country and time fixed effects, ε_{it} and ϕ_{it} are the error terms. In the estimation, to smooth out cyclical fluctuations we have split the data into six non-overlapping five-year periods (except the 1978-1980 period) and used their period averages.

Manufactures and *Skilled* refer to the natural log of real bilateral manufactured and technology-and-skill-intensive manufactured goods exports of Southern country *i* at time *t* to the North (high-income-OECD countries) and the South (low-and-middle-income countries) as a share of its real GDP.

Finance is the financial development indicator. Like in Beck (2002, 2003), Beck et al. (2000) and Levine et al. (2000), we use the real credit to the domestic private sector by deposit money banks and other financial intermediaries as a share of real GDP. For robustness the liquid liabilities to GDP ratio (*M3*) is also employed as a second measure of financial development (for details and summary statistics see the appendix) (Table 2). To limit the endogeneity issue, we used the lagged values given that we are using five-year averages.[5]

V is a vector of control variables including the following:

Population, which is the natural log of total population controls for trade shares given that larger countries may have lower export shares. Alternatively, larger countries may enjoy scale effects because of bigger size of domestic markets and have higher export shares.

GDP78, which is the natural log of initial level of real per capita GDP controls for any causality from initial income levels to trade.

FDI is the annual foreign direct investment (FDI) inflows as a share of GDP to control for the effect of FDI on export performance especially given that our sample consists of mostly emerging markets that attracted 91% (72% excluding China) of total FDI inflows to 125 developing countries, and in terms of regional distribution 100% of inflows to Middle East and North Africa (MENA), 92% to Latin America and 96% to East Asia during the period analyzed. Accordingly, countries that are export platforms such as Mexico through its Maquiladora industry may experience increases in their manufactures exports (to the North and/or South) without a significant change in their financial development. Also, given their better access to investment financing, foreign firms may affect the export performance without a significant change in domestic financial development.

GDPGN and *GDPGS* are the average logarithmic GDP growth rates in the North (i.e. high income OECD countries) and the South (i.e. low and middle income developing countries) that are included to control for long term developments and cyclical fluctuations. Increasing growth in the North (South) is expected to increase the S-N (S-S) trade (Erzan, 1989; Havrylyshyn, 1985).

B. Methodology

In order to correct for parameter endogeneity resulting from the presence of unobserved country specific effects and to correct for the reverse causality and simultaneity bias, we use the augmented system GMM estimator by Arellano and Bover (1995) and Blundell and Bond (1998).[6] Accordingly, we estimated equations (1) and (2) using the two-step system GMM estimation with Windmeijer (2005) finite-sample correction method that gives asymptotically

robust standard errors. The system GMM technique estimates a system of equations in the first differences and levels. Arellano and Bover (1995) show that when the original Arellano and Bond (1991) first differencing estimator is used the lagged level values of variables are often poor instruments for first differences. Thus, Arellano and Bover (1995) suggest that if the original equations in levels are added to the system additional moment conditions could be added to increase efficiency. Furthermore, Bond et al. (2001) shows that with a small number of time periods (based on period averages, such as five year) system GMM performs better than difference GMM. Accordingly the system pools (*t*-*s*) first difference equations with an additional set of (*t*-*s*) level equations for $x_{i,\ t\text{-}s}$. Given that remote lags are not likely to provide much additional information and that the power of overidentification test is weakened as instrument count increases relative to the sample size (Roodman, 2007), like Beck (2002) we employed only the closest possible two lags as instruments whose validity are tested by the Hansen test of overidentifying restrictions.[7] Also, the presence of serial correlation in the disturbances is tested by a second order serial correlation test in the first-differenced residuals.

C. Data and Descriptive Statistics

The bilateral trade data in total and technology-and-skill-intensive manufactures are obtained from the U.N. Commodity Trade Statistics Database (COMTRADE). For industrial classification we used the second revision of the Standard International Trade Classification of Commodities (SITC) because of its broader coverage. The sum of SITC categories 5-8 are used for total manufactures. For the examination of systematic differences in the impact of financial development on S-S and S-N trade in technology-and-skill-intensive manufactures, we selected 75 commodities that fall into the 'medium' and 'high' technology" classification of exports based on Lall (2000) and UNIDO (2004) (see the appendix for a complete list of commodities).[8]

Accordingly, medium-technology products "tend to have complex technologies, with moderately high levels of R&D, advanced skill needs and lengthy learning periods." Likewise, high technology products are those with "advanced and fast-changing technology, with high R&D investments and prime emphasis on product design. The most advanced technologies require sophisticated technology infrastructure, high levels of specialized technical skills and close interaction between firms and universities or research institutions" (Lall, 2000, 94)

The average external finance dependence of technology-and-skill-intensive manufactures is found to be 0.584 that is higher than the average of total manufactures, which range from a minimum of -0.45 in Tobacco industry to a maximum of 1.49 in drugs industry (Rajan and Zingales, 1998).[9] Because of the high variance of the share of manufactures in total merchandise exports and the fluctuations in export prices, we employed real exports (using export unit prices) as a share of real GDP in our regressions. Normalizing with real GDP also avoided distortions created by high inflation experiences of some of the countries in the sample.

In the selection of sample countries the following issues were decisive: a) the presence of a sufficiently diversified production and export structure, b) data availability since we included only those countries with at least 10 years of continuous data (to avoid non-random entry and exit bias), c) regional balance, that is to say we tried to include sufficient number of countries from each region (Asia, Middle East, and Latin America) to avoid sampling bias. The final sample includes 28 countries accounting for 81% and 79% of all Southern technology-and-skill-intensive, and total manufactures exports in 2005 with overall averages of 85% and 82% respectively between 1978 and 2005. During the period analyzed, we observe a steady increase in the sample countries' share in total world exports of manufactures and technology-and-skill-intensive manufactures going up from 4% and 2% in 1978 to 29% each respectively in 2005.

The 28 countries also account for 77% of total and 84% of technology-and-skill-intensive manufactures exports in S-S trade during the same period that reflect the existing gap between these and other developing countries. The final dataset includes 10 countries from Latin America (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Uruguay, Venezuela), 7 countries from MENA (Algeria, Egypt, Jordan, Morocco, Syria, Tunisia, Turkey), and 11 countries from East and South East Asia (China, Hong Kong, India, Indonesia, Malaysia, Pakistan, Paraguay, Philippines, Singapore, South Korea, Thailand). In the bilateral trade measurement, the North includes high-income OECD countries while the South includes all low-and-middle income countries according to the World Bank definitions.

In terms of the pattern and direction of trade in our sample, we see an increase in S-S trade compared to S-N trade in both total and technology-and-skill-intensive manufactures. Accordingly, the median share of S-S manufactures and technology-and-skill-intensive manufactures exports (in total exports of these goods from sample countries) increased from 27% and 52% in 1978 to 50% and 58% in 2005 respectively (Table 1). From the last two columns of Table 1 we also see a higher skill content of manufactures exports in S-S trade than S-N trade. Accordingly, while the average median share of skill-intensive goods in total manufactures exports is 44% in S-S trade, it is 26% in S-N trade between 1978 and 2005. However, we also observe that the skill content of S-N exports (i.e. share of technology-and-skill-intensive manufactures in total manufactures exports) has been increasing at a much faster rate with an annual average of 4.7% compared to 0.7% in S-S exports.

Furthermore, the median share of manufactures exports to the North in total Southern merchandise exports (and in GDP) increased from around 23% (3%) in 1978 to 30% (9%) in 2005 while those to the South increased from around 9% (1.4%) to 24% (4%) (Table 2).

Similarly, the median share of technology-and-skill-intensive manufactures exports to the North in total Southern merchandise exports (and in GDP) increased from around 2.6% (0.3%) in 1978 to 7.6% (1.8%) in 2005 while those to the South increased from around 4.3% (0.6%) in 1978 to 12% (1.4%) in 2005 (Table 2). In the case of changes in financial sector development, the median share of credit generated to the private sector in GDP (*Finance*) increased from around 23% in 1978 to 31% in 2005.

<Insert Table 2 Here>

IV. Empirical Results

Consistent with the findings of earlier research, the results from Table 3 and 4 suggest that financial development has a statistically and economically significant positive effect on manufactured goods exports of developing countries both to the *North* and the *South*. However, as suggested by our main hypothesis, the positive effect is found to be asymmetrical. Accordingly, a 10% increase in *Finance* (*M3*) increases the share of manufactures exports to the North and the South in GDP in the range of 5.6 - 8.0% (7.3 – 12.3%) and 7.4 – 10.9% (9.7 – 14.3%) respectively.[10] To illustrate the economic effect, let us consider Argentina. According to our point estimates (if we take the lower bounds of coefficient estimates above), an exogenous increase in the Argentina's private credit (and *M3*) to GDP ratio from its average level of 17% (24%) to the sample mean of 43% (57%) would have increased the share of manufactures exports in GDP to 1.28% (1.43%) from its current level of 0.76% for exports to the North (*Nmnxy*) and to 2.95% (3.44%) from its current level of 1.48% for exports to the South (*Smnxy*) respectively.[11]

<Insert Tables 3&4 Here>

We also find that financial development has a statistically and economically significant positive effect on the export shares of technology-and-skill-intensive manufactures in both S-S and S-N trade. However, as is the case with total manufactures exports, we found that increasing financial development increases S-S trade significantly more than S-N trade. Furthermore, as expected (due to the higher levels of external finance dependence of technology-and-skill-intensive manufactures), the positive effect is found to be economically stronger compared to the total manufactures. Accordingly, a 10% increase in private credit (*M3*) raises the share of technology-and-skill-intensive manufactures to the North and South in GDP in the range of 7.4% – 8.9% (9.4 – 14.9%) and 8.4 – 12.1% (11.8 – 16.3%) respectively. For example, the average share of technology-and-skill-intensive manufactures in GDP of Argentina is 0.26% for exports to the *North* (*Nskxy*) and 0.93% to the *South* (*Sskxy*). In this case, an exogenous increase in private credit (and *M3*) to the sample mean would have increased the share of technology-and-skill-intensive manufactures exports to the North to 0.52% (0.59) while to the South to 2.02% (2.59%) (if we take the lower bounds of coefficient estimates above).

Regarding other variables of interest, we find that both population size and initial real per capital GDP levels play a significant role mostly with regard to the technology-and-skill intensive manufactures exports to the North.

The FDI variable, on the other hand, is found to have a significantly positive effect on both S-S and S-N trade, although more so for the latter. In fact, when controlled for the FDI flows, the statistical significance of financial development variables dropped drastically (and when measured by *M3*, became insignificant) in the case of technology-and-skill-intensive manufactures exports to the North. In contrast, financial development continued to be significant at 1% level with regard to the S-S exports.

On the other hand, we did not find any economically or statistically meaningful long term effect of the Northern and Southern annual GDP growth rates except with regard to S-S trade in technology-and-skill-intensive manufactures.

In terms of the validity of the results, the Hansen specification test confirms the validity of instruments used and the AR(2) test indicate no strong sign of first or second-order serial correlation in the estimations in Table 3 and 4.

A. Sensitivity Analysis

For sensitivity analysis, first, we introduced a wider set of control variables including FDI stocks, terms of trade, real exchange rates, and initial levels of human capital measured by the average schooling years in total population in 1980. The (unreported) results were not significantly different than those reported and are available from the authors.

Second, to control for aggregation bias we repeated the regressions using four year averages. The (unreported) results were similar to those reported.

Third, we repeated the estimations after limiting the time period to 1990-2005. For a majority of the sample countries the period of 1978-1989 is characterized by autarchy under high trade barriers and limited financial development, while the 1990-2005 period is set apart by trade and financial liberalization and increasing financial development. Given the repressed nature of financial markets and lack of goods market openness in the first period financial development is not expected to improve the exports performance neither to the North or South, while the opposite is expected for the second period. In fact, the average private credit (*Finance*) and liquid liabilities (*M3*) ratios were 35% and 47% with standard deviations of 22.6 and 26.3 during 1978-1989, while they were 49% and 64% with standard deviations of 38.3 and 42 during 1990-2005. Furthermore, the effects of financial development on the pattern and direction of Southern

exports may be affected by the timing of trade liberalization. In fact, independent of financial development, given the higher levels of openness in developed countries trade liberalization in the South during the 1990s may create a bias favoring trade expansion to the North (Havrylyshyn and Wolf, 1983; Erzan, 1989). The (unreported) regression results show that financial development variable remains highly significant, both economically and statistically with regard to S-S trade. In the case of S-N trade, however, *Finance* becomes statistically insignificant, while *M3* continues to be significant at conventional levels.

Fourth, we repeated the regression analysis after dropping Algeria, which has the lowest share of Manufactures exports as a share of its merchandise exports and GDP in the sample. The (unreported) results were similar to those reported.

Lastly, focusing on both 1978-2005 and 1990-2005 periods we excluded China, Hong Kong, Malaysia, Singapore, South Korea and Thailand from the sample to see if the results are driven by the unique industrialization experiences of these Asian countries, and by the increasing intra-regional and triangular trade within East Asia (with the ultimate destination being the North) (UNCTAD, 2005a, 2007). The results from Table 5 show that while financial development is no longer a significant determinant of S-N trade, it continues to affect S-S trade at an economically and statistically significant level.[12] The findings from Table 5 may also provide support to the observations of UNCTAD (2005a, 2007) regarding the causes of the S-S trade among East Asian countries, that of being part of triangular trade with the final destination being the North.

<Insert Table 5 Here>

V. Conclusion

The paper analyzed the effects of financial development on the structure of trade from a South-South and South-North perspective. The empirical results from a 28 year panel with 28 developing countries provide support to the previous research on the relationship between financial development and the pattern of specialization in international trade. In particular, financial sector development appears to be a significant source of comparative advantage in manufactures and technology-and-skill-intensive manufactures exports. Furthermore, consistent with the predictions of previous studies, increasing financial development is found to have a stronger positive effect on exports of high value added and external finance dependent technology-and-skill-intensive manufactures compared to total manufactures.

The economic impact of financial development, however, is found to be asymmetric depending on the direction of exports. Accordingly, we find that financial development has a significantly positive and economically *asymmetric* effect on Southern total manufactures and technology-and-skill-intensive manufactures exports to the North and the South. Accordingly, financial development appears to be increasing S-S trade more than S-N trade. Furthermore, when controlling for the effects of FDI flows, and excluding the six Asian countries from the sample, we find that financial development is no longer a significant determinant of S-N trade. In contrast, however, we continue to find financial development as a robust and significant factor in S-S trade. As a result, our findings extend the previous research by showing the differential impact of financial development on the direction of developing country manufactures exports.

In terms of policy implications, our findings suggest that improving the financial sector development and credit availability in developing countries can significantly expand the S-S trade in manufactures and, in particular, technology-and-skill-intensive manufactures. However,

given the low levels of credit availability in a majority of sample countries (despite comprehensive financial liberalization programs), some sort of industrial policy in the form of directed and subsidized credit programs through domestic or regional development banks may be of substantial importance in supporting the diversification and expansion of technology-and-skill-intensive manufacturing sectors. However, we also need to point out that the countries studied had higher levels of industrial and human capital development (compared to low-income South) during the ISI years under autarchy, thus the results may not apply to other Southern countries. Furthermore, increasing financial development may not deliver the same benefits in low income countries as in middle income ones because of lower institutional quality of their financial systems that might be more binding as income levels decrease.[13]

Endnotes

[1] For a critical review of this last point see Demetriades and Hussein (1996).

[2] See, for example, Balassa (1986), Krugman (1981), and Dutt (1986).

[3] This point has also been argued by the studies on N-S trade and uneven development. See Darity and Davis (2005) for a comprehensive review.

[4] For a discussion, see Rodrik (2004) and UNCTAD (2005, 2007).

[5] However, the results using current period values were not significantly different.

[6] The panel data estimates are obtained using the xtabond2 command in Stata 9.2 written by David Roodman.

[7] The reported results are robust to longer lags of the instrument used.

[8] According to Lall (2000), medium-technology products "tend to have complex technologies, with moderately high levels of R&D, advanced skill needs and lengthy learning periods." Likewise, high technology products are those with "advanced and fast-changing technology, with high R&D investments and prime emphasis on product design. The most advanced technologies require sophisticated technology infrastructure, high levels of specialized technical skills and close interaction between firms and universities or research institutions." (p.94)

[9] The averages are from Rajan and Zingales (1998) estimation for the 1980s. External finance dependence is defined as the share of capital expenditures not financed from internal funds.

[10] The reported results are based on the two-step estimation. However, as argued by Arellano and Bond (1991) and Blundell and Bond (1998), the two-step standard errors are downward biased. To correct this, we used the Windmeijer (2005) finite sample correction. In addition, repeating the analysis using one-step estimation yielded similar results, both economically and statistically.

[11] That is for *Nmnxy*, the predicted level is found as: exp(0.93*0.56+ln(0.76)) where 0.93 is the exogenous increase in private credit to GDP ratio.

[12] The results using *M3* were similar to those reported.

[13] For evidence, see, for example, Demetriades and Law (2006).

Appendix

A. Data Definitions:

Finance: Private credit by deposit money banks and other financial institutions as a share of GDP. Given the inconsistency between a stock and flow ratio, it is calculated using the following deflation method as in Beck (2002): $\{(0.5)*[Credit_t/Pe_t + Credit_{t-1}/Pe_{t-1}]\}/[GDP_t/Pa_t]$ where credit is private credit by deposit money banks and other financial institutions to the private sector (IFS lines 22d and 42d), Pe is end-of period CPI (IFS line 64M..ZF or, if not available, 64Q..ZF) and Pa is average annual CPI (IFS line 64..ZF), and GDP is in local currency (IFS line 99B..ZF or, if not available, line 99B.CZF). Raw data are extracted from the electronic version of the IMF's International Financial Statistics (IFS).

M3: Liquid liabilities as a share of GDP. Liquid liabilities are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. It is from the online World Development Indicators database of World Bank (WDI).

The exports data from COMTRADE (and OECD for Turkey) are in current dollars. In converting to real values we used exports price indices (i.e. unit values of aggregate or manufactures exports depending on availability) from IFS, WDI and central bank and statistical institutes of South Korea and Turkey. The real GDP values are from WDI in constant 2000 dollars. Merchandise exports are f.o.b. valued in current U.S. dollars (WDI).

FDI inflows are from the WDI, and FDI stock values are from UNCTAD FDI database.

Population, GDP78, GDPGN and GDPGS are from WDI.

B. Summary Statistics

<Insert Table 6 Here>

C. List of Technologically Medium to High Skill Commodities SITC Rev. 2

<Insert Table 7 Here>

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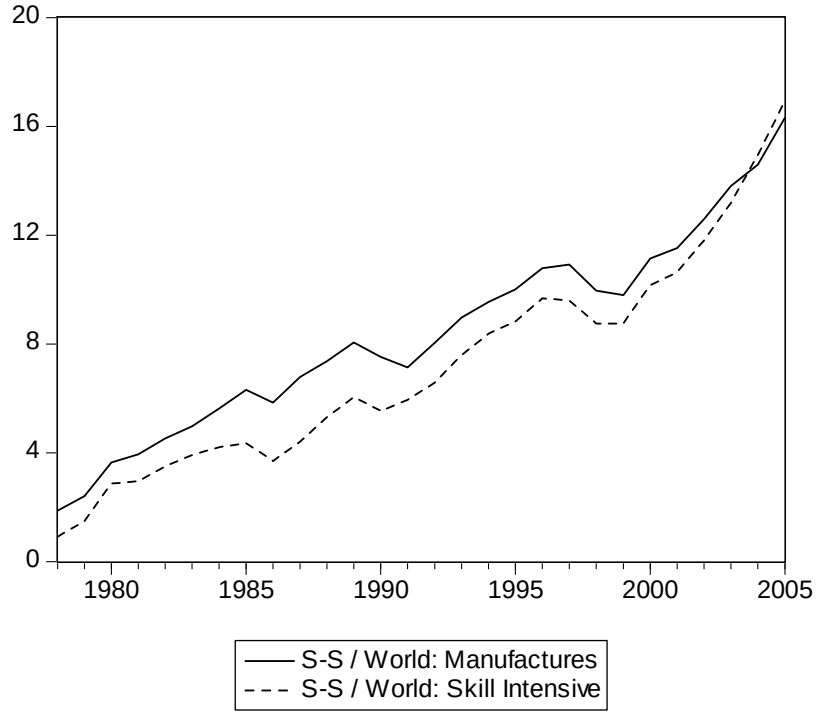
Figure 1: Share of S-S Exports in World Exports (percentages): 1978-2005



Source: COMTRADE and authors' calculations.

Notes: S-S / World: Manufactures and S-S / World: Skill Intensive refer to the share of S-S total manufactures, and technology-and-skill-intensive manufactures exports in World Manufactures Exports respectively.

Table 1: Trends in S-S Trade (percentages)

	Share of S-S Exports in Total Southern Exports		*Median Share of … Exports of the Sample going to the South*		*Median Share of Skill-Intensive Goods in Total Manufactures Exports*	
Year	*Manufactures*	*Skill-Intensive Manufactures*	*Manufactures*	*Skill-Intensive Manufactures*	*S-S*	*S-N*
1978	34	39	27	52	41	11
1979	37	42	35	56	44	11
1980	45	53	45	67	42	17
1981	45	52	50	70	39	15
1982	46	53	46	59	38	20
1983	43	49	44	57	36	17
1984	42	48	40	63	39	22
1985	44	48	41	65	39	21
1986	41	43	37	58	44	24
1987	43	45	37	53	41	23
1988	43	45	41	58	43	22
1989	43	46	38	52	43	25
1990	42	45	38	50	42	24
1991	41	46	41	55	40	23
1992	41	45	40	57	38	24
1993	40	44	40	57	42	22
1994	41	44	42	55	44	23
1995	41	43	43	53	42	23
1996	42	44	46	53	42	27
1997	41	43	44	52	42	28
1998	38	39	41	53	42	31
1999	36	37	39	46	45	39
2000	37	38	42	47	47	39
2001	38	40	42	50	51	36
2002	42	43	43	52	52	34
2003	43	45	45	52	51	35
2004	42	45	47	53	48	34
2005	45	48	50	58	49	41
Mean	41	45	44	57	44	26

Source: COMTRADE and authors' calculations.

Table 2: Sample Summary (percentages)

Medians											
		Total Manufactures				*Technology-and-Skill-Intensive*					
		North		*South*		*North*		*South*			
Year	*N*	*Nmnxt*	*Nmnxy*	*Smnxt*	*Smnxy*	*Nskxt*	*Nskxy*	*Sskxt*	*Sskxy*	*Finance*	*M3*
1978	8	22.63	2.93	9.03	1.38	2.55	0.33	4.31	0.64	22.89	35.04
1979	10	21.06	3.19	11.52	1.49	2.75	0.35	4.46	0.72	23.64	37.38
1980	16	14.53	1.39	11.17	1.33	2.07	0.21	3.81	0.42	25.79	36.71
1981	18	15.84	1.42	11.22	1.34	1.84	0.09	5.24	0.46	26.26	36.66
1982	19	20.12	1.72	13.24	1.23	2.67	0.22	4.91	0.37	30.23	38.91
1983	24	20.99	1.48	10.60	1.18	2.36	0.15	4.14	0.38	32.35	38.29
1984	24	21.63	1.66	12.13	1.37	2.56	0.21	4.62	0.41	32.91	40.24
1985	24	22.90	1.96	12.47	1.53	2.61	0.25	6.03	0.50	30.20	41.05
1986	26	23.16	1.96	15.06	1.74	2.86	0.30	6.19	0.45	27.56	43.27
1987	27	23.91	2.76	14.66	1.99	3.76	0.37	6.54	0.43	26.07	44.14
1988	27	24.49	2.75	16.86	1.95	4.14	0.48	6.13	0.74	25.09	44.92
1989	27	27.74	3.29	16.22	1.85	4.34	0.66	6.26	0.80	27.96	42.38
1990	27	26.35	3.03	16.80	1.96	4.73	0.74	6.14	0.73	24.51	40.48
1991	27	29.53	3.06	18.56	2.39	4.84	0.69	6.56	0.75	25.88	44.29
1992	27	29.96	3.70	17.67	2.24	5.01	0.70	6.65	0.80	24.06	44.31
1993	27	32.76	3.40	20.39	2.86	5.52	0.71	7.31	1.16	27.92	46.64
1994	27	32.04	4.45	20.24	3.05	6.19	0.96	7.00	1.28	32.78	46.22
1995	28	30.75	4.29	20.60	3.37	5.29	0.92	7.09	1.14	35.53	44.21
1996	28	27.91	3.92	20.57	3.24	5.25	0.82	8.63	1.16	39.53	47.85
1997	28	26.22	4.68	20.41	3.45	5.79	0.88	8.10	1.27	41.79	49.83
1998	28	33.44	5.63	21.19	3.43	7.79	1.35	9.95	1.53	41.61	50.49
1999	28	44.96	6.22	22.55	2.98	10.85	1.87	10.05	1.33	43.24	54.55
2000	28	39.80	6.35	22.23	3.42	11.80	1.82	10.61	1.44	40.55	53.75
2001	28	35.12	6.95	24.33	3.85	8.95	1.36	11.49	1.61	35.87	59.46
2002	28	36.33	6.94	22.96	3.75	9.26	1.47	12.21	1.57	33.41	59.67
2003	28	33.19	8.40	23.34	3.75	8.97	1.40	11.61	1.44	32.62	59.31
2004	28	30.62	8.05	24.25	3.86	7.91	1.45	11.88	1.44	32.56	55.96
2005	27	30.37	8.76	24.07	4.18	7.61	1.81	11.98	1.85	31.04	54.59

Source: COMTRADE and authors' calculations.

Notes: *N* is number of countries; *Nmnxt* and *Smnxt* are manufactures exports to the North and South as a share of merchandise exports respectively. *Nmnxy* and *Smnxy* are real manufactures exports to the North and South as a share of real GDP respectively. *Nskxt* and *Sskxt* are technology-and-skill-intensive manufactures exports to the North and South as a share of merchandise exports respectively. *Nskxy* and *Sskxy* are real technology-and-skill-intensive manufactures exports to the North and South as a share of real GDP respectively. *Finance* is median share of credit generated to the private sector as a share of GDP and *M3* is the median share of liquid liabilities in GDP.

Table 3: Determinants of Manufactured and Skilled Goods Exports as a Share of GDP

	MNXY						*SKXY*					
	North			*South*			*North*			*South*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Finance	0.72***	0.56***	0.80***	0.99***	0.74***	1.09***	0.83*	0.74*	0.89*	1.06***	0.84***	1.21***
	(0.22)	(0.21)	(0.22)	(0.19)	(0.24)	(0.16)	(0.49)	(0.43)	(0.51)	(0.28)	(0.28)	(0.28)
Population	0.14	0.19	0.15	0.01	0.01	-0.02	0.48*	0.62**	0.48*	0.14	0.17	0.15
	(0.19)	(0.13)	(0.17)	(0.15)	(0.13)	(0.16)	(0.25)	(0.26)	(0.26)	(0.15)	(0.14)	(0.14)
GDP78	0.11	-0.05	0.12	0.1	-0.06	0.06	0.95***	0.64	0.96***	0.34	0.24	0.34*
	(0.37)	(0.24)	(0.33)	(0.18)	(0.22)	(0.19)	(0.34)	(0.45)	(0.36)	(0.24)	(0.19)	(0.20)
FDI		0.16***			0.13**			0.22*			0.17***	
		(0.04)			(0.05)			(0.12)			(0.06)	
GDPGN			0.02			0.03			0.13			-0.04
			(0.06)			(0.09)			(0.08)			(0.09)
GDPGS			0.09			0.10			0.23*			0.17**
			(0.08)			(0.08)			(0.12)			(0.07)
constant	-4.24	-3.96	-5.24	-3.03	-1.44	-3.16	-17.72***	-18.31***	-19.54***	-8.07**	-7.74**	-9.66**
	(5.55)	(3.82)	(4.58)	(3.81)	(3.87)	(4.08)	(6.73)	(6.99)	(6.62)	(4.05)	(3.91)	(3.89)
AR1	0.36	0.51	0.38	0.87	0.23	0.75	0.29	0.68	0.30	0.88	0.23	0.80
AR2	0.25	0.73	0.23	0.17	0.76	0.15	0.30	0.88	0.29	0.01	0.38	0.01
Hansen	0.33	0.47	0.45	0.35	0.33	0.50	0.52	0.42	0.62	0.44	0.50	0.59
Obs	132	132	132	132	132	132	132	132	132	132	132	132
Groups	28	28	28	28	28	28	28	28	28	28	28	28

Notes: Period dummies not reported. *MNXY* and *SKXY* are (real) total and technology-and-skill-intensive manufactures exports to real GDP ratios, *Finance* is the credit to the private sector as a share of GDP, *Population* is the total population, *GDP78* is the per capita real GDP in 1978, *FDI* is the real FDI inflows. *GDPGN* and *GDPGS* are the average annual real GDP growth of the North and the South respectively. All variables (except FDI) are in natural logarithms. (***), (**), (*) denote significance at 1, 5 and 10% levels. All regressions are estimated using two-step system GMM method with Windmeijer finite-sample correction. *Hansen* is Hansen over-identifying restrictions test, *AR1* and *AR2* are AR(1) and AR(2) tests. Test statistics are given by their p-values. *Obs* is the number of observations, and *Groups* is the number of cross section groups.

Table 4: Determinants of Manufactured and Skilled Goods Exports as a Share of GDP

	MNXY						*SKXY*					
	North			*South*			*North*			*South*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
M3	1.23***	0.73**	1.20**	1.43***	0.97***	1.42***	1.41***	0.94	1.49***	1.58***	1.18***	1.63***
	(0.37)	(0.33)	(0.53)	(0.32)	(0.33)	(0.32)	(0.52)	(0.61)	(0.49)	(0.37)	(0.37)	(0.37)
Population	0.16	0.20	0.18*	0.04	0.06	0.03	0.59***	0.68***	0.59***	0.22	0.21	0.24*
	(0.14)	(0.13)	(0.10)	(0.10)	(0.12)	(0.10)	(0.21)	(0.24)	(0.21)	(0.16)	(0.17)	(0.15)
GDP78	0.18	0.10	0.16	0.20	0.04	0.19	0.88**	0.72*	0.88***	0.51*	0.31	0.57*
	(0.26)	(0.17)	(0.25)	(0.20)	(0.26)	(0.21)	(0.34)	(0.39)	(0.31)	(0.31)	(0.25)	(0.31)
FDI		0.15***			0.15***			0.23**			0.17**	
		(0.04)			(0.05)			(0.09)			(0.07)	
GDPGN			-0.001			0.02			0.12			-0.09
			(0.09)			(0.08)			(0.09)			(0.10)
GDPGS			-0.17			0.10			0.17			0.13*
			(0.17)			(0.07)			(0.12)			(0.08)
constant	-7.21	-5.72	-7.79*	-6.20*	-4.24	-6.55**	-21.83***	-20.92***	-23.26***	-13.00**	-10.38**	-14.59***
	(4.82)	(3.85)	(4.22)	(3.41)	(4.44)	(3.31)	(5.97)	(6.66)	(5.43)	(5.26)	(5.07)	(4.79)
AR1	0.83	0.43	0.81	0.50	0.04	0.50	0.20	0.70	0.20	0.33	0.04	0.33
AR2	0.26	0.66	0.25	0.91	0.44	0.90	0.29	0.91	0.29	0.12	0.88	0.12
Hansen	0.55	0.64	0.76	0.39	0.41	0.50	0.37	0.53	0.49	0.45	0.54	0.56
Obs	132	132	132	132	132	132	132	132	132	132	132	132
Groups	28	28	28	28	28	28	28	28	28	28	28	28

Notes: Notes: Period dummies not reported. *M3* is the natural log of the liquid variables to GDP ratio. For other variable definitions see Table 3.

Table 5: Determinants of Manufactured and Skilled Goods Exports (excluding East Asia)

	1978-2005				*1990-2005*			
	Nmnxy	*Smnxy*	*Nskxy*	*Sskxy*	*Nmnxy*	*Smnxy*	*Nskxy*	*Sskxy*
Finance	0.36	0.40**	0.38	0.62**	0.11	0.55**	-0.13	0.83***
	(0.26)	(0.20)	(0.52)	(0.26)	(0.35)	(0.26)	(0.56)	(0.20)
Population	0.23	-0.02	0.64***	0.16	0.26	-0.01	0.68***	0.14
	(0.15)	(0.11)	(0.26)	(0.16)	(0.17)	(0.09)	(0.26)	(0.13)
GDP78	-0.08	-0.15	0.48*	0.22	-0.14	-0.14	0.35	0.27*
	(0.21)	(0.14)	(0.29)	(0.16)	(0.26)	(0.13)	(0.34)	(0.16)
FDI	0.16***	0.03	0.24**	0.05	0.16***	0.06	0.28**	0.05
	0.06	(0.07)	(0.12)	(0.08)	(0.06)	(0.06)	(0.11)	(0.06)
constant	-3.73	1.10	-16.64**	-6.43	-3.12	-0.17	-15.25**	-7.78***
	(4.12)	(2.78)	(6.69)	(3.95)	(4.99)	(2.29)	(7.05)	(2.88)
AR1	0.78	0.99	0.53	0.93	0.49	0.90	0.25	0.22
AR2	0.39	0.67	0.85	0.20	0.18	0.24	0.84	0.02
Hansen	0.81	0.84	0.74	0.90	0.32	0.29	0.64	0.35
Obs	105	105	105	105	66	66	66	66
Groups	22	22	22	22	22	22	22	22

Table 6: Descriptive Statistics and Correlation Analysis

	Nmnxt	*Nmnxy*	*Smnxt*	*Smnxy*	*Nskxt*	*Nskxy*	*Sskxt*	*Sskxy*	*Cr*	*M3*
Mean	28.66	9.38	19.22	6.81	11.07	5.00	9.59	4.39	43.03	56.67
Median	26.31	3.33	18.01	2.35	4.89	0.69	6.47	0.98	30.23	46.28
Minimum	0.08	0.01	0.21	0.06	0.00	0.00	0.00	0.00	4.14	9.25
Maximum	82.19	69.49	56.02	104.17	64.90	61.56	42.74	88.77	176.72	265.79
Stdev	20.30	13.82	12.52	12.81	13.41	10.15	8.93	10.18	33.43	37.27
Obs	692	692	692	692	692	692	692	692	769	771
Pairwise Correlations										
Nmnxt	1									
Nmnxy	0.55	1								
	(0.00)									
Smnxt	0.43	0.52	1							
	(0.00)	(0.00)								
Smnxy	0.29	0.90	0.60	1						
	(0.00)	(0.00)	(0.00)							
Nskxt	0.75	0.68	0.36	0.45	1					
	(0.00)	(0.00)	(0.00)	(0.00)						
Nskxy	0.42	0.93	0.45	0.86	0.72	1				
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)					
Sskxt	0.42	0.73	0.86	0.78	0.60	0.72	1			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)				
Sskxy	0.26	0.89	0.55	0.99	0.47	0.89	0.77	1		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Cr	0.37	0.73	0.57	0.69	0.45	0.63	0.68	0.65	1	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
M3	0.26	0.67	0.56	0.70	0.34	0.56	0.63	0.65	0.82	1
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Notes: *Stdev* is the standard deviation and *Obs* is number of observations. P-values are in parenthesis. Refer to Table 2 and 3 for other variable definitions.

Table 7: List of Technologically Medium to High Skill Commodities SITC Rev. 2

266 Synthetic Fibres to spin	743 Pumps nes, centrifuges etc
267 Other man-made fibres	744 Mechanical handling equ
512 Alcohols, Phenols etc	745 Nonelec machy, tools nes
513 Carboxylic acids etc	749 Nonelec mach pts, acc nes
524 Radioactive etc material	751 Office machines
533 Pigments, Paints, etc	752 Automtic data proc equip
541 Medicinal, pharm products	759 Office, adp mch pts, acces
553 Perfumery, Cosmetics, etc	761 Television receivers
554 Soap, Cleansing etc preps	762 Radio broadcast receivrs
562 Fertilizers, manufactured	763 Sound recrdrs, phonograph
572 Explosives, Pyrotech prod	764 Telecom equip, pts, acc nes
582 Prod of condensation etc	771 Electric power machy nes
583 Polymerization etc prods	772 Switchgear etc, parts nes
584 Cellulose derivatives etc	773 Electr distributing equip
585 Plastic material nes	774 Electro-medcl, xray equip
591 Pesticides, disinfectants	775 Household type equip nes
598 Miscellaneous chemical prods	776 Transistors, valves, etc
653 Woven man-made fib fabric	778 Electrical machinery nes
671 Pig iron etc	781 Pass Motor Veh Exc Buses
672 Iron, steel primary forms	782 Lorries, Spcl mtr veh nes
678 Iron, steel tubes, pipes etc	783 Road motor vehicles nes
711 Steam boilers & aux plnt	784 Motor veh prts, access nes
712 Steam engines, turbines	785 Cycles, etc motrzd or not
713 Internal combust pstn engn	786 Trailers, non-motor veh, nes
714 Engines and motors nes	791 Railway vehicles
716 Rotating electrical plant	792 Aircraft etc
718 Other power generating machy	793 Ships and boats etc
721 Agric machinery, exc tractors	812 Plumbg, heatng, lghtng equ
723 Civil engineering equip etc	871 Optical instruments
724 Textile, leather machinery	872 Medical instruments nes
725 Paper etc. mill machinery	873 Meters and counters nes
726 Printing, bkbinding machy, pts	874 Measurng, contrlng instrument
727 Food machy non-domestic	881 Photo apparat, equipt nes
728 Othr machy for spcl Indus	882 Photo, cinema supplies
736 Metalworking mach-tools	884 Optical goods nes
737 Metalworking machnry nes	885 Watches and clocks
741 Heating, cooling equip	951 War firearms, ammunition
742 Pumps for liquids etc	