Foreign Direct Investment, Terms of Trade, and Quality Upgrading: What Is So Special about South Asia?

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The existing literature has highlighted the positive effect of foreign direct investment (FDI) on export upgrading and associated terms of trade in developing economies. However, the FDI effect has been found to be negative in South Asia. In this paper, we elaborate on the South Asia-specific effect by emphasizing the role of human capital in the positive link between FDI and terms of trade. We argue that education levels in South Asia have lagged behind those in East Asia and other developing regions. This has resulted in a world market integration strategy in South Asia that specializes in less skills-intensive products and generates associated FDI flows. We demonstrate these patterns for two South Asian economies (Bangladesh and Pakistan) and two East Asian economies (Malaysia and Thailand) for which historical breakdowns of FDI data are available.
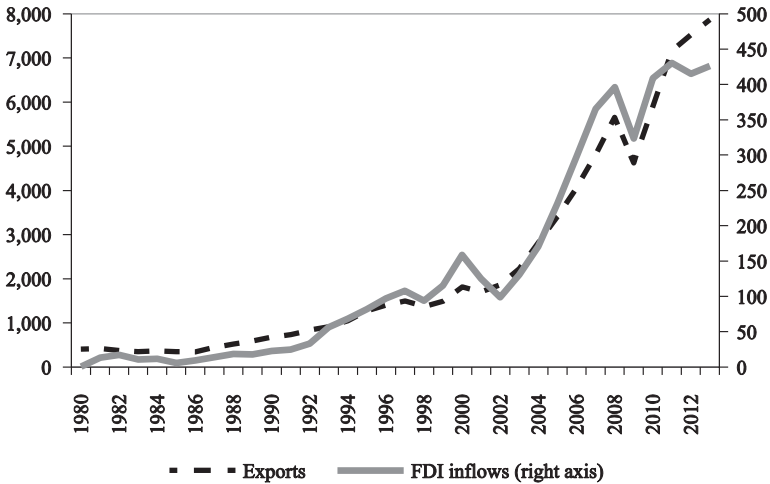
I. Introduction

How economies best integrate into the world economy and what types of goods and services they produce and export is subject to a vivid academic debate (e.g., Hausmann, Hwang, and Rodrik 2007; Lin 2011; Lederman and Maloney 2012). This question is also of importance because it shapes the optimal design and degree of industrial policies, especially in developing and emerging economies.

A recent strand in the literature has emphasized the role of foreign direct investment (FDI) and its effects on export unit values in this context (Harding and Javorcik 2012, Wacker [forthcoming]), as increases in the latter can either be interpreted as a measure for export upgrading or as the purchasing power of exports

Figure 1. **FDI Inflows and Exports in Developing Asia**
($ billion)

FDI = foreign direct investment.
Notes: Values at current prices and exchange rates. Exports comprise goods and services.
Source: United Nations Conference on Trade and Development.

via terms of trade (i.e., export prices relative to import prices).[1] This debate thus ties in with classical arguments in development economics viewing unfavorable export prices and terms of trade trends in developing economies as a reflection of the less sophisticated goods they export, most notably commodities (Singer 1950, Prebisch 1950), with little income elasticity and unfavorable long-run perspectives (Sarkar and Singer 1991).

In a seminal paper, Singer (1950) argued that such patterns of world market integration with declining terms of trade in developing economies are widely shaped by foreign investment. This potential relationship between FDI, export patterns, and terms of trade is of special importance for South Asia and East Asia for at least two reasons.[2] First, as economic rationale suggests, FDI and export volume are highly correlated in developing Asia (Figure 1). Second, Li, Huang, and Li (2007) argued that FDI might have lowered the terms of trade in the People's Republic of China (PRC), while Wacker (forthcoming) finds a positive effect of FDI on developing economies' terms of trade, with a negative effect in South Asia constituting the only exception.

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[1]The traditional terms of trade argument is emphasized, for example, by De Long and Summers (1991), Levine and Renelt (1992), and Harrison and Rodríguez-Clare (2009). Terms of trade and export unit values are closely related as the former are the ratio of export unit values to import unit values. For early contributions emphasizing the quality upgrading argument, see Schott (2004), Hummels and Klenow (2005), and Dulleck et al. (2005).

[2]Throughout this paper, we follow the World Bank's regional classifications, which group Bangladesh, India, Pakistan, and Sri Lanka into South Asia; and the PRC, Indonesia, Malaysia, the Philippines, and Thailand into East Asia.

Figure 2. **Trade Openness and FDI Inflows in South Asia and East Asia**
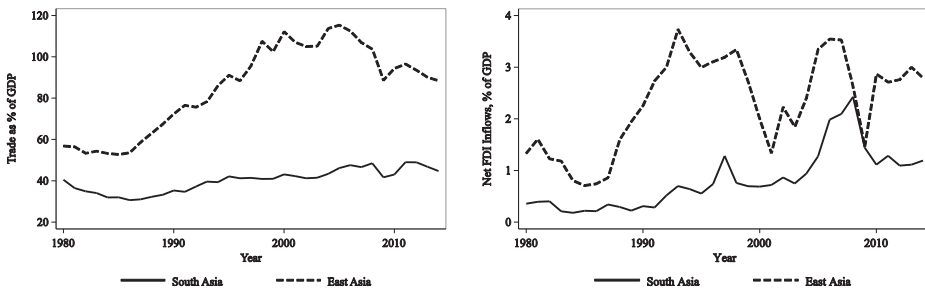
FDI = foreign direct investment, GDP = gross domestic product.
Notes: Values computed as unweighted averages for Bangladesh, India, Pakistan, and Sri Lanka (South Asia); and for the People's Republic of China, Indonesia, Malaysia, the Philippines, and Thailand (East Asia).
Source: World Bank. *World Development Indicators 2014*. http://data.worldbank.org/sites/default/files/wdi-2014 -book.pdf

In this paper, we elaborate on the latter result. Our key argument is that South Asia and East Asia have followed two very different strategies of FDI-led world market integration. To be more precise, East Asia pursued a strategy of export upgrading and quality improvements (quality competitiveness) in line with its factor endowment, most notably a relatively educated labor force, while attracting associated types of FDI.

Furthermore, East Asia's economic development process took off relatively early and, as Figure 2 illustrates, its economies opened up earlier and more dynamically than South Asia's beginning in the late 1980s.[3] East Asian economies thus managed to seize certain export niches with according market power. With these niches occupied, later-developing South Asian economies could not simply follow the same world market integration strategy, thus making the case that an intra-Asian process of "kicking away the ladder" exists.[4] Moreover, South Asia was not equipped with a similarly educated labor force that would have been necessary for export upgrading. Instead, it conquered world market shares using a price competitiveness integration strategy. In line with this argument, when FDI started pouring into South Asia and trade openness continued to moderately increase (Figure 2), the region experienced a considerable decline in net barter terms of trade

[3]Of course, the groupings of South Asian and especially East Asian economies are heterogeneous among themselves. Generally speaking, levels of trade openness are lower in South Asia than in East Asia. Among the former, Sri Lanka stands out as being the most open. The accelerating trend in the 1980s was especially pronounced in Malaysia, the Philippines, and Thailand. The PRC, on the other hand, has long had levels of openness almost as low as the South Asian average, passing the 50% threshold only in the early 2000s. Concerning FDI, inflows to South Asia have been lowest in Bangladesh, while Sri Lanka stands out again for having experienced positive inflows in the 1980s when inflows to other South Asian economies were negligible.

[4]Our argument in this regard should not be confused with the more institutional argument of Chang (2002), who contends that developed economies are deliberately attempting to "kick away the ladder" that they have climbed through the use of industrial policies.

Figure 3. **Terms of Trade in Asia**
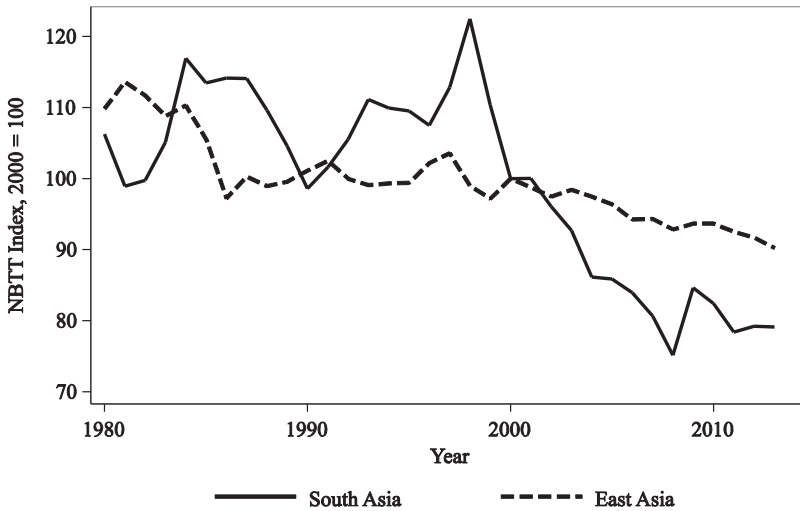
NBTT = net barter terms of trade.
Notes: Values computed as unweighted averages for Bangladesh, India, Pakistan, and Sri Lanka (South Asia); and for the People's Republic of China, Indonesia, Malaysia, the Philippines, and Thailand (East Asia).
Source: World Bank. *World Development Indicators 2014*. http://data.worldbank.org/sites/default/files/wdi-2014 -book.pdf

(NBTT) of almost 40% in the decade following the 1997/98 Asian financial crisis (Figure 3).[5]

We support our arguments concerning different FDI-led world market integration strategies and associated terms of trade effects in South Asia and East Asia with economic arguments and a descriptive analysis of FDI and export product market data. Due to the lack of comprehensive historical FDI data with a sectoral breakdown, we rely on case studies for Bangladesh and Pakistan in South Asia, and Malaysia and Thailand in East Asia as a sectoral breakdown of historical FDI data is available for each of these economies.

Our paper is organized as follows. Section II reiterates the finding of an exceptional negative relationship between FDI and terms of trade in South Asia, and provides new econometric evidence of this relationship. Section III elaborates on the potential reasons for this South Asia-specific relationship, combining stylized facts with key economic rationales. Section IV demonstrates related patterns in FDI

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[5]NBTT are calculated as the percentage ratio of the export unit value indexes to the import unit value indexes of an economy, measured relative to the base year 2000. A closer look shows that this development was mainly driven by Bangladesh and Pakistan, and to a lesser extent Sri Lanka. Indian terms of trade dropped in the aftermath of the 1997/98 Asian financial crisis, but have then risen steadily since 2004 to levels well above precrisis values. A similar, yet weaker, decline in NBTT since 1998 can be observed in Thailand, the Philippines, and the PRC. Indonesia saw an unprecedented rise in terms of trade over the same period, while figures in Malaysia remained roughly constant.

and exports, focusing on the four economies mentioned above. Section V provides a policy discussion. Section VI concludes.

II. The Special Effect of Foreign Direct Investment on Terms of Trade in South Asia: Econometric Evidence

The previous literature has pointed out several reasons why FDI should have an impact on an economy's export prices and terms of trade (e.g., Findlay 1980; Darity Jr. 1990; Li, Huang, and Li 2007; Harding and Javorcik 2012; Wacker [forthcoming]). Potential channels that this literature has highlighted include the macroeconomic transfer problem, product upgrading effects due to FDI that show up as price increases, the pricing power and markups of multinational firms, and FDI's effects on the aggregate marginal product of capital that influence terms of trade in the long run (Darity Jr. 1990).[6]

Since these effects of FDI on terms of trade operate in different directions, the question of which effect is most important essentially becomes an empirical one and motivates the study of Wacker (forthcoming) that this section largely relies on. Following the rationale that FDI should influence developing economies' terms of trade, an econometric model is estimated that explains an economy's NBTT as a log-linear function of the FDI stock relative to gross domestic product (GDP) and a set of control variables:[7]

$$\ln(NBTT)_{it} = \varphi \ln(NBTT)_{i,t-1} + \beta FDI/GDP_{it} + X_{it}\vec{\theta} + \varepsilon_{it}, \qquad (1)$$

where ε includes economy and year fixed effects. As there are several endogeneity concerns, the model is estimated using System GMM (i.e., instrumenting current levels of the lagged dependent variable and of FDI stock by lags of the first-differenced series). The set of control variables in X that is motivated by previous studies on terms of trade developments mainly captures the industry structure, labor market developments, and primary macroeconomic indicators (e.g., exchange rate, real interest rate, inflation, current account balance, and trade openness). The dataset covers more than 50 developing economies during the period 1980–2008.[8]

In the estimated Equation (1) presented above, there is an economically relevant and statistically significant positive impact of FDI on developing economies' NBTT. However, given that there are ambiguous economic channels for this

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[6]The transfer problem suggests an adverse impact of international monetary transfers on relative prices, see Dixit and Norman (1980), and Krugman and Obstfeld (2000) for a textbook treatment.

[7]NBTT capture the price developments of an economy's export basket relative to its import basket. They are distinct from terms of trade measures that look at commodity prices relative to manufacturing prices (often called commodity terms of trade) and do not take into account changes in trade volumes (as income terms of trade do) or productivity developments (factorial terms of trade).

[8]A detailed explanation of the dataset, its sources and summary statistics, and the econometric method used is given in Wacker (forthcoming).

relationship that might also vary geographically, it is meaningful to check for regional heterogeneity and estimate Equation (1) in the form

$$\ln(NBTT)_{it} = \varphi \ln(NBTT)_{i,t-1} + \sum_{j=1}^{6} \beta_j FDI/GDP_{it} + X_{it}\vec{\theta} + \varepsilon_{it},\qquad(2)$$

for the $j = 1, \ldots, 6$ regions (East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa) as classified by the World Bank. Then, the hypothesis of equality of β-parameters for all regions can be investigated using an F-test. We find that the null hypothesis of parameter homogeneity ($\beta_j = \beta$ for all j) can easily be rejected and thus sequentially test down our model (from general to specific), using likelihood ratio tests, F-tests, and other standard model selection criteria. The overwhelming evidence from this statistical exercise is that the only β-parameter standing out is that for South Asia, covering observations of Bangladesh, India, Pakistan, and Sri Lanka.[9] That is, from a statistical perspective, the model that is best or most likely to be true for explaining dynamic developments in NBTT is of the form

$$\ln(NBTT)_{it} = \varphi \ln(NBTT)_{i,t-1} + \beta_{SA}FDI/GDP_{it} + \beta_{RDW}FDI/GDP_{it} + X_{it}\vec{\theta} + \varepsilon_{it},$$

$$(3)$$

where β_{SA} is a separate parameter for South Asia and the parameter β_{RDW} describes the impact of FDI for the rest of the developing world.

Our estimation results show a strongly negative (and highly significant) impact of FDI on terms of trade for South Asia of -2.1% and a positive (and weakly significant) impact of 0.3% for the rest of the developing world in the first column of Table 1 (both are long-run parameters, calculated as $\beta/[1 - \varphi]$). Concerning the control variables, few of them turn out to be statistically significant, although standard errors are often of reasonable size compared to the estimated parameters. The distributed lag specification of the current account balance, motivated by the findings of Santos-Paulino (2010), and the differing prefix on the lag structure support a dynamic response of terms of trade to the current account. There is some evidence that the actual deviation from the long-run growth rate positively impacts terms of trade, supporting an economic relationship between business cycle fluctuations and terms of trade that is beyond the scope of this paper (see Prebisch 1950, and Thirlwall and Bergevin 1985 for more on the issue). Membership in a

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[9]It was also investigated whether the different impact in South Asia is driven by individual economies. For this purpose, one South Asian economy at a time and any set of two South Asian economies at a time have been excluded from the regression. In each case a similar picture emerged, rejecting the suspicion that the effect is driven by individual economies.

Table 1. **Regression Results**

Dependent Variable: ln(NBTT)			
ln(NBTT) (−1)	0.7076***	0.7065***	0.7238***
	(0.2084)	(0.2439)	(0.1903)
FDI stock/GDP for South Asia (−1)	−0.0060***	−0.0062***	−0.0063***
	(0.002)	(0.0022)	(0.0022)
FDI stock/GDP for rest of the world (−1)	0.0009**	0.0009**	0.0009**
	(0.0003)	(0.0004)	(0.0004)
Agricultural and raw material exports (%)	0.0020	0.0019	0.0018
	(0.0016)	(0.0018)	(0.0015)
Current account balance (% of GDP)	0.0058***	0.0057	0.0045***
	(0.0015)	(0.0040)	(0.0015)
Current account balance (% of GDP) (−1)	−0.0028*	−0.0029	−0.0020
	(0.0014)	(0.0028)	(0.0014)
Real GDP per capita	0.0000		
	(0.0000)		
Inflation (annual %)	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Manufacturing exports (%)	−0.0000		
	(0.0003)		
Real interest rate	−0.0000		
	(0.0006)		
Services value-added (% of GDP)	0.0004		
	(0.0008)		
Deviation from long-run growth	0.4356**	0.4453	
	(0.1682)	(1.5110)	
Deviation from long-run growth (−1)	0.0258		
	(0.2118)		
Unemployment rate	0.0013	0.0015	0.0012
	(0.0010)	(0.0015)	(0.0008)
Regional Trade Agreement membership	−0.0351**	−0.0378**	−0.0414***
	(0.0172)	(0.0187)	(0.0142)
No. of instruments	44	39	38
Hansen test (p-value)	0.994	0.748	0.857
AR Bond z statistic for AR(1)	−2.39	−2.56	−2.46
AR Bond z statistic for AR(2)	−1.14	−0.57	−0.88

FDI = foreign direct investment, GDP = gross domestic product, NBTT = net barter terms of trade.
Notes: *** = 10% level of statistical significance, ** = 5% level of statistical significance, * = 1% level of statistical significance. Results of one-step System GMM estimation with economy and time fixed effects with cluster-robust standard errors covering 490 observations in 52 developing economies.
Source: Authors' calculations.

regional trade agreement—such as the ASEAN Free Trade Area, Central America Free Trade Agreement, or Mercosur—seems to increase pressure on developing economies' export prices, supporting the arguments and findings in Lutz and Singer (1994) that fallacy of (export) composition in developing economies might worsen their terms of trade.

Because many of the control variables lack statistical significance, we test for joint significance (Wald test) of all variables with a p-value of the initial t-statistic above 0.5. This concerns the control variables—GDP, manufacturing exports, real interest rate, and lagged deviation from the long-run growth rate—which are omitted

from the regression in the second column of Table 1. There is only a minor quantitative impact on the central variables of interest (FDI in South Asia and the rest of the world, lagged dependent variable). Since the t-statistic of the deviation from the long-run growth rate has a p-value above 0.5 in this specification, it is omitted from the regression depicted in the third column, which again has a negligible impact on our finding concerning the overall positive impact of FDI on developing economies' terms of trade with the exception of a negative relationship in South Asia.

As an additional robustness check, we test to what extent the results are driven by post-2000 observations. FDI flows were quite volatile in the mid- to late 2000s and the most dramatic decline in terms of trade in South Asia began in the late 1990s (Figure 2). Therefore, as a first step, we exclude the post-2005 and post-2000 observations. For another robustness check, we include a South Asia-specific, simple time trend in the model. In all cases, our overall results remain unaffected.[10]

Quantitatively, the estimated effects for South Asia and its differences with the rest of the developing world are economically large: a long-run coefficient of 2.1% ($\beta/[1 - \varphi]$) means that a 1 percentage point increase (decrease) in the FDI stock-to-GDP ratio causes the NBTT to decrease (increase) by 2.1%. While being considerably larger in absolute magnitude than in other developing economies, FDI stocks and flows relative to GDP are lower in South Asian economies.

A.   Variation between Economies

To provide further evidence of the different effect of FDI on terms of trade in South Asia compared with the rest of the world, we estimate a functionally different unconditional cross-economy model using the same dataset as above:

$$g(NBTT)_i = \alpha + \beta \times avg(FDI\,flow/GDP)_i + \epsilon_i \qquad (4)$$

where g is the average annual growth rate from the beginning of the sample to the end of the sample and avg is the mean for each economy over the sample period. In essence, this is a between-effects estimator that does not make specific assumptions about the dynamics of the underlying process and that might seem simplistic but is intuitive to interpret and has generally shown to perform well for long-run estimations, especially in the context of parameter heterogeneity in dynamic settings (e.g., Baltagi and Griffin 1984, Pesaran and Smith 1995, Pirotte 1999, Hauk and Wacziarg 2009, Stern 2010). Although our exercise is mainly for descriptive purposes, it nevertheless reinforces the claim that South Asia is different, as the

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[10]Results are available upon request. When limiting the sample to the pre-2000 observations, the decreased sample size gives rise to statistical insignificance for the South Asia-specific FDI parameter, but the size of estimated parameters stays largely unaffected, making it unlikely that the economic relationship was different between the subperiods. For the other two robustness checks, both parameters are statistically significant (at the 10% level at least) and show the expected prefix. Therefore, equality of FDI parameters between South Asia and the rest of the developing world can be rejected at the 5% level of statistical significance.

Figure 4. **NBTT versus FDI/GDP**
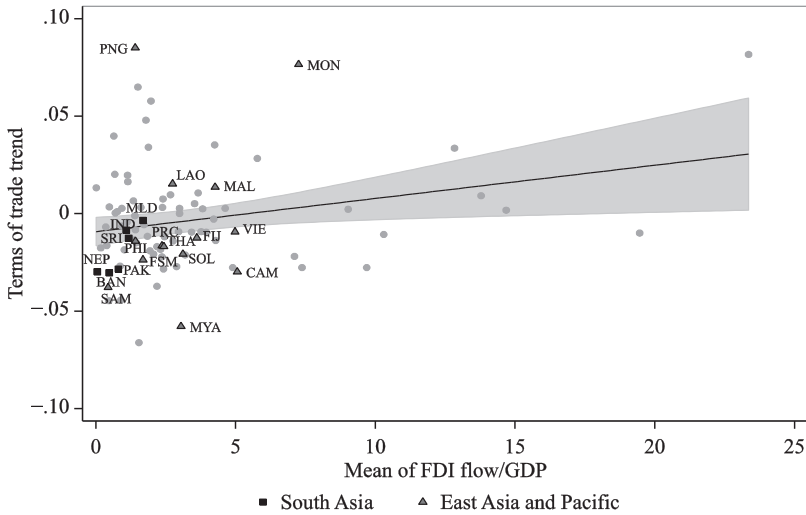
BAN = Bangladesh, CAM = Cambodia, FDI = foreign direct investment, FIJ = Fiji, FSM = Federated States of Micronesia, GDP = gross domestic product, IND = India, LAO = Lao People's Democratic Republic, MAL = Malaysia, MLD = Maldives, MON = Mongolia, MYA = Myanmar, NBTT = net barter terms of trade, NEP = Nepal, PAK = Pakistan, PHI = Philippines, PNG = Papua New Guinea, PRC = People's Republic of China, SAM = Samoa, SOL = Solomon Islands, SRI = Sri Lanka, THA = Thailand, VIE = Viet Nam.
Note: The figure depicts the slope of the regression coefficient β from equation (4) with corresponding standard errors and the actual observed data points for Asian economies.
Source: Wacker, K. M. Forthcoming. Do Multinationals Deteriorate Developing Economies' Export Prices? The Impact of FDI on Net Barter Terms of Trade. *World Economy*.

initial exercise identifies over-time variation within economies, while our second estimation is a correlation across economies. Figure 4 shows the upward-sloping fitted line for the whole set of developing economies, confirming a positive correlation between FDI and NBTT. The figure also includes the individual observations for South Asia (squares) and East Asia and Pacific (triangles). While there is no obviously clear pattern for East Asian economies, South Asian economies are apparently clustered below the regression line β, indicating that their terms of trade development would benefit less from FDI than the overall sample of developing economies.

III. Why Is the Effect of Foreign Direct Investment on Terms of Trade Different in South Asia?

As we argued at the beginning of the previous section, there are different channels through which FDI may impact terms of trade, and these impacts may operate in opposite directions. In order to understand the negative impact of FDI on terms of trade in South Asia, in contrast to all other developing regions, it is instructive to reconcile the potentially most important channels in more detail.

Table 2. **Different Coefficients for FDI Impacts for Different Subsamples**

	Estimated Parameter	Standard Error of Parameter	F-stat (d.f.) (p-val)
Education I: Percentage of primary school completed			
Below sample median	0.00064	0.00070	1.74 (1, 43)
Above sample median	0.00176	0.00067	(0.1944)
Education II: Years of schooling			
Below sample median	−0.00072	0.00097	6.78 (1, 43)
Above sample median	0.00165	0.00059	(0.0126)

FDI = foreign direct investment.

Note: The table depicts the different impacts the regression coefficient β from Equation (1) has for different subsamples of economies.

Source: Wacker, K. M. Forthcoming. Do Multinationals Deteriorate Developing Economies' Export Prices? The Impact of FDI on Net Barter Terms of Trade. *World Economy*.

Our key argument concerns the role of product upgrading that can take place either directly through FDI or through interindustry and intra-industry spillovers (e.g., Javorcik 2004, Havranek and Irsova 2011, Harding and Javorcik 2012). If this effect is large, it will lead to an increase in export unit values and terms of trade, as the latter reflect (at least partially) such quality upgrading effects (e.g., Lipsey 1994, Schott 2004, Hummels and Klenow 2005, Silver 2010).

A.   The Role of Education

For this effect to be prevalent, however, a sufficient level of human capital in the host economy is crucial. This is demonstrated in Table 2, which shows that the effect of FDI on terms of trade is particularly positive in economies with above-median levels of education. The underlying regression is the model in Equation (1) but the parameter estimate for the impact of FDI, β, is allowed to vary between economies above and below the sample median value in educational attainment. The results indicate that economies with a higher percentage of completed primary schooling obtain stronger positive effects of FDI on terms of trade (although the difference is not statistically significant). Furthermore, economies with below-median years of schooling suffer from a negative impact of FDI on terms of trade, while those with more years of schooling experience a strong positive impact. The difference between these two types of economies is statistically significant at the 5% level as shown by the results of an F-test reported in the rightmost column of Table 2. This is in line with Borensztein, De Gregorio, and Lee (1998), who find that FDI flows to 69 developing economies after 1970 had a positive impact on productivity only when the host economy had reached a minimum level of human capital development. Thus, our finding supports the view that the positive impact of FDI on terms of trade is either fostered by or requires a threshold level of education.

Educational levels have historically been very different between South Asia and East Asia, with attainment levels in South Asia being very low by international

Figure 5. **Educational Attainment in East Asia versus South Asia, 1960–2010**
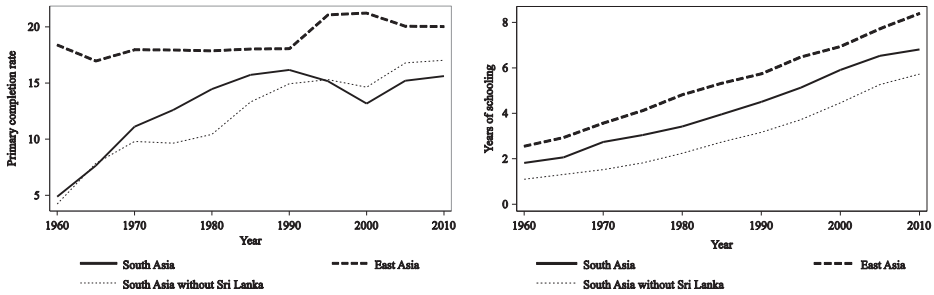
Note: Values computed as unweighted averages for Bangladesh, India, Pakistan, and Sri Lanka in South Asia; and for the People's Republic of China, Indonesia, Malaysia, the Philippines, and Thailand in East Asia.
Source: Barro, R., and J.–W. Lee. 2013. A New Data Set of Educational Attainment in the World, 1950–2010. *Journal of Development Economics* 104 (2013): 184–98.

standards. This is depicted in Figure 5 showing the (unweighted) average primary completion rate of 15-year olds (left panel) and years of schooling (right panel). South Asia has consistently trailed East Asia in terms of educational attainment over the past 50 years. The disparities between the two regions become even more pronounced if Sri Lanka is taken out of the sample. Less than 10% of 15-year olds in India and Pakistan and only 15.8% in Bangladesh had completed primary school in 1980. Although the gap in primary completion has narrowed over the past decade, it takes time for these changes to translate into a better-educated workforce. East Asia could thus rely on a broader skills base when its economies opened up, allowing for more product upgrading through FDI, which requires an educated workforce. This precondition was not present in South Asia, thereby reducing the positive effects of FDI in South Asia, which might explain the different impact that FDI has had on terms of trade in South Asian economies.

B.   Pricing Power and Market Share

Our argument of a skills shortage as an impediment to moving toward higher segments of the value chain relates to the recent literature on export composition (Hausmann, Hwang, and Rodrik 2007) and the traditional argument in the literature on the Prebisch–Singer hypothesis that industrialized and developing economies produce different types of products (e.g., Sarkar and Singer 1991). As lower-quality, less skill-intensive products are more reproducible and more homogenous, their exporters will possess less market and pricing power, resulting in a terms of trade decline, as outlined by structuralist contributions to the Prebisch–Singer hypothesis (e.g., Emmanuel [1969] 1972, Raffer 1987).

Even though FDI might still considerably increase productivity in cases where the low-skill export sector expands, the mode of FDI-led world market integration and associated terms-of-trade effects are very different, as productivity increases

translate into lower costs and export prices as opposed to upgrading and pricing power effects. We call the former a price competitiveness approach to world market integration and the latter a quality competitiveness approach.

C.   Types of Foreign Direct Investment and Its Relation to Human Capital

An additional potential explanation for the differing terms-of-trade effects of FDI is that such investment can come in the form of horizontal FDI, mainly substituting for trade by domestically serving host markets, and vertical FDI, essentially slicing up the value chain and producing upstream goods in the developing host economy.

The key motive for vertical FDI is a multinational firm's holdup problem: if a vertically integrated corporation in an industrialized economy faces an imperfect input good (upstream) market in a developing economy, the upstream firm will produce too low a quantity in order to maximize profits. The (multinational) downstream firm will have an incentive to enter the upstream market because marginal production costs are lower than the price it actually pays for the input. Leaving aside the problem of transfer pricing, the entry of a foreign firm into the upstream market will increase the produced quantity and thereby lower the price for the upstream good. As quantity effects are not considered in NBTT, this transnational engagement will, ceteris paribus, lead to a fall in the upstream (developing) economy's terms of trade (Wacker 2011).

The literature on FDI and multinationals highlights the role of differences in human capital endowment as an important determinant of vertical versus horizontal FDI flows. More precisely, Blonigen, Davies, and Head (2003) find that absolute skills differences between the parent and host economies of FDI reduce horizontal FDI, while Davies (2008) shows that vertical FDI increases with a skills difference between the parent and the host. On the other hand, a large host economy will induce more horizontal FDI as the large market size will compensate for high entry costs.

Given that South Asian economies historically have low-skill labor forces (and therefore considerable human capital differences with FDI home economies), and are moderately attractive for market-seeking horizontal FDI (with the exception of India), most FDI in the region might be driven by vertical motives, thus potentially leading to negative terms-of-trade effects.

In the next section, we empirically elaborate on these economic arguments, using descriptive data for four Asian economies.

IV. Foreign Direct Investment and World Market Integration in Four Asian Economies: An Empirical Investigation

Very few economies publish FDI data with a comprehensive industry-level breakdown, especially in developing and emerging economies, which makes it

difficult to provide convincing evidence about the different effects of FDI on terms of trade.[11] We therefore rely on the analysis of two East Asian and two South Asian economies for which data were available through national sources while remaining cognizant of the limitations of this approach. Furthermore, we consult trade data published by the World Trade Organization (WTO).[12] Constructing export profiles for all economies in our sample allows us to identify the most competitive sectors, measured by the size of exports relative to worldwide exports in the respective product group, and observe changes over time.[13] Combining both yields a detailed picture of each economy's strengths. It also allows us to draw conclusions about the specific role of FDI in an economy and its relevance for increases in exports. In our South Asia group, sectoral FDI data are available for Bangladesh and Pakistan.[14] In our East Asia group, we take a closer look at Malaysia and Thailand.

A. Export Composition and Foreign Direct Investment in Two Sample South Asian Economies

FDI flows into Pakistan have been relatively diversified. The most relevant sector is transport and communications, which accounted for 26% of cumulative FDI inflows in 2000–2012. Finance, food, and the oil and gas sectors saw considerable FDI inflows as well. The textiles sector has received little to no FDI inflows, although it ranks prominently among exports. The manufacture of textile articles and grain mill products are Pakistan's most successful exports; there has been relatively little change in the composition of the economy's top 10 list of exported goods over the last decade (see Appendix for more detail). The most significant new entrant to the list of the top 10 exported goods over this period was cement, lime, and plaster. Bangladesh has attracted relatively little FDI overall. However, the textile and garment sector is on the rise and accounted for 24% of the total FDI stock in 2011, which is a similar share to that of the electricity, gas, and water sector.

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[11]Even if data were available for all economies in our regions of interest, considerable issues of measurement and comparability would remain. Sectoral classifications vary from source to source, while some economies publish actual realized FDI and others publish all FDI that has been approved by the relevant authorities. There is no publicly accessible dataset that addresses all of these concerns. The most advanced approach is the investment map constructed by the International Trade Center (ITC). But since it does not date back far enough in time for most economies, we chose for our analysis to primary rely on national data sources where a historical sectoral breakdown was available. However, we supplement these national data by double-checking with ITC data to the extent possible.

[12]More precisely, we analyze exports classified under ISIC Revision 3 HS 1998/92 (World Integrated Trade Solution) to ease the comparisons with the sectoral FDI data. For each economy, we compare the earliest to the latest available period. Top 10 lists of the products with the highest share in the world market are calculated at the 4-digit level. These lists are available in the Appendix.

[13]For Pakistan, the earliest available trade data in our chosen nomenclature is 2003; the latest is 2014. This rather short and recent observation period explains why the changes remain small, but does not affect our other conclusions. For Bangladesh, the earliest data are taken from 1989. The latest available data is from 2011. Malaysia and Thailand both have 1989 as the year in which the earliest data are available and 2014 as the latest.

[14]In Bangladesh, the central bank surveys foreign investors periodically and disaggregates FDI inflows by sector, component type, and economy of origin. In Pakistan, the Board of Investment publishes sector-wise FDI inflows. In both economies, the data collection is generally presented according to the financial year, which runs from 1 July until 30 June. In Malaysia and Thailand, sector-disaggregated FDI data are made available by the central banks.

FDI in the finance sector ranked third and accounted for 20% of the inward stock, according to ITC data.[15] Similar to Pakistan, the export profile of Bangladesh is very much focused on textiles and textile-related products (see Appendix for more detail). With the top four exported goods categories all being different forms of textiles, the economy has focused on low-cost manufacturing as a means of export-led development. The degree of specialization is very high: the top four product categories account for over 85% of all Bangladeshi exports. The most significant change in the list of leading exported goods between 1989 and 2011 was that a new entrant made it to the second spot on the list. A form of textile products that barely registered among the economy's exports in 1989 with a 0.8% share accounted for 30.9% of the economy's exports in 2011.

Bangladesh can be seen as a poster child of the price competitiveness approach, in which FDI in tradable sectors flows into low-quality, highly-competitive product segments. Nevertheless, considering the relatively poor FDI performance of textiles compared to the sector's total exports, the role of domestic companies should not be understated. At the same time, this does not conflict with our claim that FDI helps shape the export structure of the entire economy.

B.   Comparisons with Two Sample East Asian Economies

In our East Asian examples, the story is quite different as higher-value manufacturing products rank more prominently in the export structure. In Malaysia, this coincides with a high level of FDI inflows into manufacturing in the 1990s that gradually shifted into the tertiary sector in the 2000s. According to official data (Bank Negara Malaysia 2009), cumulative net FDI inflows in manufacturing amounted to 63% of FDI in 1990–1999 before falling to 41% in 2000–2009. This difference was added to the share of FDI flows into the services sectors, primarily the finance sector, which is consistent with Malaysia's position as an important regional financial hub. The trade profile reveals that the most successful Malaysian products are electronic components and machines, crude and refined petroleum products, and vegetable and animal oils and fats (see Appendix for more detail). Some higher-value products were among the top 10 exports in 2014, including transmitters and office, accounting, and computing machinery.

For Thailand, the relation between sectoral FDI inflows and export dynamics is even more striking. Cumulative FDI inflows in 2005–2011 reveal that almost 49% of FDI targeted manufacturing, with financial services being the second most important

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[15]The exact sizes of different sectors differ by data source (e.g., due to definitions of FDI, differences between registered and realized investments, and partly due to different sector classifications) and examined time period (especially due to large-scale, lumpy FDI in individual sectors). The relative importance of the textile and garment sector, however, is beyond doubt, especially within the manufacturing and tradable sector (see, for example, Tables VI and IX in Bangladesh Bank 2014) and when taking into account that the sector is very labor-intensive (i.e., investment data tend to underestimate its relevance).

sector at 21%. A further disaggregation of FDI in the manufacturing sector reveals that the largest recipient product groups were motor vehicles, electrical equipment, electronics and optics, and plastics. These sectors, especially motor vehicles and associated parts and components, also had the strongest export performances between 1989 and 2014, often with significant changes in world market shares during the review period. Many of the higher-value manufactured exports were insignificant in the economy's export profile in 1989 but were among the top 10 exported goods in 2014 (see Appendix for more detail). This is clear evidence that FDI flows have gone into higher segments of the value chain in Thailand than in Bangladesh, for example. Furthermore, these FDI flows have possibly helped upgrade Thailand's export portfolio. Apart from this upward movement along the value chain, we also find evidence that FDI is used as a bridgehead into foreign markets: 37% of FDI inflows in the review period were of Japanese origin. As Nguyen (2013) highlights, these Japanese FDI flows have been export- and long-run oriented, and clustered in the electronics value chain. Japanese FDI flows have recently moved to other East Asian economies as well, such as Indonesia and Viet Nam, the latter of which has been explicitly targeting export-oriented FDI.

C.   The Larger Picture

The trade profiles for all four economies in our sample of developing Asia show a strong trend of upward movement along individual value chains. However, the prospects of these value chains might differ substantially since some offer more promising outlooks than others. For example, the textiles value chain remains rather competitive, while the electronics industry provides more space for product differentiation and quality- and competitiveness-led strategies. Accordingly, Pakistan and Bangladesh have each only managed to obtain modest market shares of up to 6.2% in certain product groups, mostly low-skill textile manufacturing. Some upticks in market shares have been recorded in recent years. Malaysia, on the other hand, attained considerable market shares in higher-skill products (e.g., 7.8% in electronic valves, tubes, and other components; and up to 12.8% for some higher-value commodity processing), which is an impressive performance considering it is the smallest in terms of population among our four sample economies. In Thailand, which has the second smallest population among the sample group, the situation is somewhat veiled by the exceptional dynamics in the export sector. For example, until 2011, each of Thailand's four top export products held a world market share of more than 10%, while the remaining top 10 export products held a world market share of at least 5%. Only 3 years later, the picture had changed, with moves into higher-skill and -value manufactures at the expense of market shares. However, Thailand still holds significant world market shares in products that are not on its top 10 export list (e.g., a 10.8% share for sugar, which ranks 24th among exported goods).

Looking at other East Asian economies, the dominant impact of the PRC in trade becomes apparent. In 2014, the PRC held export shares of over 40% in all 10 of its leading export categories and shares of over 25% in a total of 38 export categories. The export portfolio is well-rounded in general. The economy has also achieved the remarkable feat of steadily reducing the share of its textile exports while simultaneously increasing its world market share. To put this into perspective, the PRC has achieved a 45% share of world exports in the market segment of wearing apparel except fur apparel, which at the same time only accounted for about 6% of its domestic exports in 2014. This also happens to be the most important export segment for Bangladesh and the second most important segment for Pakistan, neither of which achieved a world market share of more than 4% in this category despite their narrow specialization.

Indonesia holds considerable shares in some export market segments as well. The economy has intensified the export of hard coal and lignite since 2009, accounting for world export shares that exceed 20% and 80%, respectively. The Philippines lags behind in this aspect but has managed to develop export market power in at least one category, carpentry and joinery, accounting for over 18% of world exports in 2014. India again offers a somewhat diverse picture with dynamic changes in recent years. Historically, jewelry has been India's most important export in terms of world share, reaching 28% in 2011. However, the sector's export share has since been in decline, with a world market share of 16% in 2014. In the meantime, the manufacture of grain mill products rose from a world market share of 10% in 2011 to become India's leading export with a 20% share in 2014. Finally, Sri Lanka's most important export is textiles, comprising 36% of all exports, yet its textile exports only comprise a world market share of 1.2%. No other Sri Lankan export exceeds this level of world export share.

Aside from the lower-skill and -value exports and small world market shares in South Asia, another difference with East Asia is the high concentration of exports among just a few products. Bangladesh provides the most striking example with almost 80% of exports concentrated in two product groups, neither of which reached a world market share of more than 6.2%, and over 95% of exports concentrated in the top 10 product groups. In Pakistan, the top two and top 10 product groups account for 37% and 76% of exports, respectively. In Malaysia, the top two and top 10 products account for 30% and 65% of exports, respectively, even though Malaysia has only about one-fifth of either Pakistan's or Bangladesh's population and its exports could thus be expected to be more specialized. The picture is even more striking in Thailand, with the respective shares being 16% and 46%. In general, it seems that East Asian economies managed to conquer more markets and niches, especially in higher-value products, than South Asian economies, even without as much export specialization.[16] This might potentially indicate that South Asia is in a less favorable

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[16]This general picture does not apply to India to the same extent.

Table 3. **Export Complexity of Investigated Economies, 2012**

Rank	Economy	ECI Value
24	Malaysia	0.99
33	Thailand	0.88
91	Pakistan	−0.34
119	Bangladesh	−0.92

Notes: The Economic Complexity Index (ECI) is a measure of an economy's export diversity and sophistication.
Source: The Observatory of Economic Complexity. Economic Complexity Index. http://atlas.media.mit.edu/en/rankings/country/2012/

position in the product space in which spillovers and complementarities between products are less relevant (Hidalgo et al. 2007).

FDI inflows have been more concentrated in East Asian economies, about half of which in Malaysia and Thailand have targeted the manufacturing sector. This suggests that FDI might be conducive to movements in the product space in general, and upward movements more specifically, potentially supporting pricing power and associated terms-of-trade effects. In South Asia, FDI flows were more scattered across sectors, with services (communications, finance, and transport) and oil and gas receiving considerable shares. The fact that one-fourth of FDI in Bangladesh flowed into textiles is consistent with the shape of the economy's export structure—the top four exported goods are textile-related and account for 85% of exports—but despite this enormous specialization, the economy was not able to develop large market shares and associated pricing power, potentially because the sector is characterized by homogenous products with low-skill content in which competition is fierce.

The considerably higher export sophistication of Malaysia and Thailand compared with Pakistan and Bangladesh is also mimicked in the Massachusetts Institute of Technology's Economic Complexity Index, which is presented in Table 3. The index takes into account the ubiquity and diversification of an economy's export structure. That is, economies that export several different products obtain a high diversification measure. But as it is easier to produce products that are ubiquitous, these products get less attention in the overall index. The measure is thus highly informative for our analysis as it shows whether economies have the capability to produce a diversified export portfolio and manage to be highly competitive in certain product niches that are less occupied by other economies. It is clear from Table 3 that this applies considerably more to East Asian economies than their South Asian counterparts—a general picture that holds beyond our four-economy example.[17]

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[17]The rankings of other East Asian economies include the PRC (22), the Philippines (46), and Indonesia (69). The rankings of other South Asian economies include India (54) and Sri Lanka (86).

Questions arising from our quantitative assessment of FDI inflows and export specialization are to what extent East Asia's focus on higher-skill products is preferable to South Asia's world market integration strategy, and to what extent the latter can be seen as a temporary or transitory phenomenon in the development process. We discuss these issues along with policy considerations in the next section.

V. Policy Discussion

We have argued that South Asian and East Asian economies followed different strategies of world market integration in the sense that the latter achieved considerable upward movement along the value chain (quality competitiveness), while the former conquered foreign markets by stronger reliance on price competitiveness. We have further argued that these integration strategies were in line with the respective factor endowments (i.e., a higher-skilled labor force in East Asia) and broadly in line with patterns of FDI inflows that potentially helped shape the export structure and mode of world market integration.

Is either of the two different world market integration strategies more favorable from a development perspective? When looking at some basic macroeconomic indicators, South Asia and East Asia have both achieved impressive development progress. East Asian economies have achieved average annual growth of 7.1% since 1990, while South Asian economies have achieved average growth of 4.4% per year.[18] Hence, both subregions outperformed (by more than one standard deviation) the 2% per year per capita historical growth average that Summers and Pritchett (2014) calculated for all economies since 1950. Meanwhile, extreme poverty in East Asia declined from 78% of the population in 1981 to 8% in 2011. While progress in reducing extreme poverty in South Asia has also been impressive, the gains have been less dramatic with the ratio falling from 61% to 25% over the same period.[19]

These crude numbers suggest that economic development has been more rapid in East Asia, yet our main argument holds that these economies started out with a considerably higher human capital base and thus more favorable initial conditions. Furthermore, one could argue that South Asia is simply at an earlier stage of the development path. For example, the PRC initially also integrated into the world economy via low-end production goods such as clothing, footwear, and furniture, which all appear to have peaked at 40%–50% of total imports in the United States and European Union as the PRC moves toward higher rungs of the production ladder (Nguyen 2013).

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[18]Growth of real GDP per capita in purchasing power parity terms, calculated based on the Word Bank's *World Development Indicators*. East Asia only includes developing economies.

[19]Following World Bank standards, extreme poverty is defined as the population living on less than $1.25 per day in purchasing power parity terms.

Figure 6. **Export Complexity over Time**
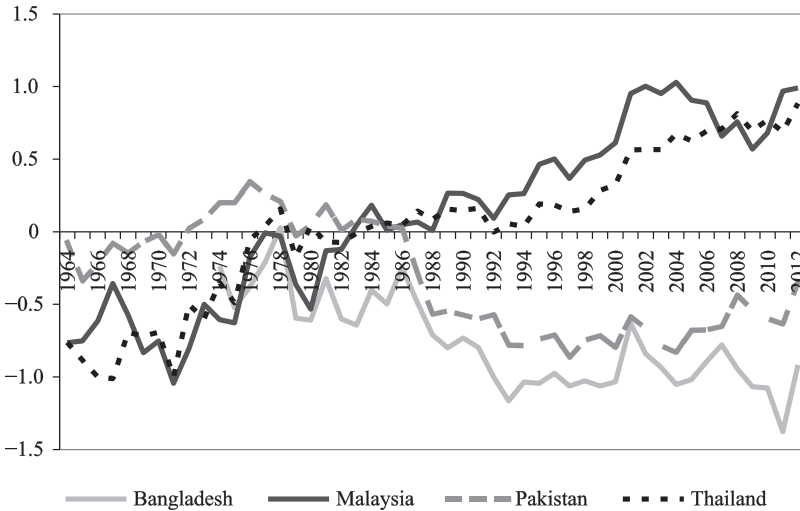
Notes: The Economic Complexity Index (ECI) is a measure of an economy's export diversity and sophistication.
Source: The Observatory of Economic Complexity. Economic Complexity Index. http://atlas.media.mit.edu/en
/rankings/country/2012/

A. Is South Asia Simply at an Earlier Stage of the Development Path?

In our view, there are two key reasons casting doubt on the possibility that
South Asian economies are simply at an earlier stage of an established development
path that will ultimately lead them to the same destination as their East Asian
peers.

First, if South Asian economies are increasingly upgrading their export
structure, we should find such a trend in the data. However, as the development
of the Economic Complexity Index over time suggests (Figure 6), this is not the
case: the index has stagnated over the last 2 decades for our South Asian sample
economies (Bangladesh and Pakistan), while it has continuously increased since the
1960s for our East Asian sample economies (Malaysia and Thailand). This pattern
seems consistent with path dependence in production structures as suggested by the
product space literature (Hidalgo et al. 2007).

Second, upgrading the human capital base at later stages of world market
integration becomes increasingly difficult as the increased demand for tradables will
also increase wage pressures for civil servants such as teachers despite unchanged
productivity (see Sen 1999). Sen has emphasized how important pursuing human
resource development before embarking on wider development goals has historically
been for East Asian economies such as Meiji, Japan; the Republic of Korea; and
Taipei,China.

B.   Or Did East Asian Economies Kick Away the Ladder for South Asia?

Finally, there is also the possibility that East Asian economies kicked away the upgrading ladder for their South Asian peers: when East Asian economies embarked on their export-oriented development strategies, markets for many higher-value products were still available and they could integrate via a quality competitiveness strategy. Supported by FDI, they were able to occupy upper segments of the value chain and enjoy market power to achieve favorable export prices and terms of trade in these product segments. The opposite is true for South Asian economies, which have had to integrate via more competitive markets, generally through price competition.

This interpretation raises the question to what extent less developed economies can fully choose their own growth strategy when integrating more deeply into the world economy. As more economies move up the ladder of product development, an increasing number of the higher rungs become occupied.[20] In our view, this casts some doubt on the extent to which successful development strategies in open economies of the past can be copied by other economies, and about the extent to which South–South cooperation can be beneficial to lower-income economies.

C.   What Are the Policy Lessons?

Do our findings about the South Asia-specific effects of FDI on terms of trade and the role of human capital in this context imply that economies' world market integration strategies and development pathways are shaped by geography and educational history while not leaving much scope for policy? In our view, there is no need for such a fatalistic interpretation of the evidence.

For starters, the world market integration strategy of South Asia relative to East Asia and other developing economies is not necessarily determined by geography. It rather accidentally coincides with the World Bank's regional classifications and actually represents differing underlying fundamentals. And as the literature on export upgrading suggests, such fundamentals, like factor endowments and institutions, play an important role for specialization patterns but do not uniquely determine what an economy can and will export.

As the literature emphasizes, fostering an environment that promotes entrepreneurship and investment in new activities is critical to creating information spillovers for higher-potential sectors (see Rodrik 2004). Active FDI attraction, e.g. through investment promotion agencies, can be part of such a policy (Harding and Javorcik 2011, 2012). However, as our analysis suggests, the sectoral distribution of FDI matters in this context. Our above reasoning and previous results in the

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[20]This is consistent with the empirical finding of Harding and Javorcik (2012) that FDI does not make developing economies' export structure more similar to that of higher-income economies, and with Rodrik's (2014) argument of premature (de-)industrialization, which pointed out that industrialization in low-income economies is running out of steam considerably earlier than has traditionally been the case.

literature (Borensztein, De Gregorio, and Lee 1998) further highlight the relevance of improving the human capital stock through education at early stages of the development process.

Finally, while our econometric results in section II can in principle be interpreted as causal, they are conditional on country-specific effects and associated initial conditions. In fact, the South Asia-specific (and education-specific) FDI effects highlight how these initial conditions matter. Accordingly, one should not draw the policy conclusion that preventing FDI inflows would have been beneficial for South Asian economies. First, falling terms of trade might simply reflect productivity increases in homogenous products in those economies. Second, the interesting policy question in our view is not whether FDI inflows should be banned but to what extent initial conditions and capabilities can be changed by policy.

VI. Conclusions

In this paper, we replicated and substantiated earlier findings that FDI has had a detrimental effect on terms of trade in South Asia, as opposed to the positive terms-of-trade effect it has had in the rest of the developing world. As this relationship seems to depend on the level of human capital, and building on the observation that education levels in South Asia are considerably lower than in East Asia and many other regions of the developing world, we provided an explanation for this South Asia-specific effect.

We have argued and supported with descriptive evidence that, by building on a high human capital base, East Asia managed to considerably upgrade its export structure. Its product portfolio is now more complex and diversified, and these economies have managed to acquire considerable world market shares in certain higher-quality niches such as electronic components, motor vehicles, and office machinery, as well as higher-value commodity processing. These niches largely corresponded with the structure of earlier FDI inflows. Given the market power these economies could develop in their product categories, they were able to integrate into the global economy using a quality competitiveness approach that was accompanied by favorable terms of trade developments.

In contrast to East Asia's experience, South Asian economies found several of these high-potential product niches already occupied once they increasingly industrialized and integrated into the world economy. In line with their much lower human capital endowment, these economies specialized in lower-skill goods, most notably textiles. In Bangladesh, this was accompanied by significant FDI inflows into the textile sector, while FDI inflows into our other example economy, Pakistan, were spread across different sectors. Generally, South Asian exports are less complex and less diversified than East Asian exports, and South Asian economies have not managed to acquire large global market shares. Given the associated homogeneity

and ubiquity of their export products, South Asian economies have not developed much export pricing power and have had to integrate into the world economy through a price competitiveness approach that corresponded with declining terms of trade.

Our contribution thus relates to recent approaches about export upgrading, product space, and the role of FDI in this process (Hausmann, Hwang, and Rodrik 2007; Harding and Javorcik 2012). However, it also builds a bridge to earlier contributions in the development literature that interpreted declining terms of trade in developing economies as a feature of the specific goods they produce (Sarkar and Singer 1991), and saw this export structure being largely shaped by foreign investment (Singer 1950).

Given the relevant interactions between initial human capital endowment, FDI, and export structure that we highlight in this paper, we think that future studies on the most appropriate design and sequencing of policy reforms—such as skills upgrading, tax reform, regulation, financial deepening, and investment promotion—would be highly beneficial for effective policy making, especially in economies starting out from low levels of development and education. In this context, we would like to emphasize that our results can only help explain the specific interaction of FDI, export prices, and world market integration in Asia but cannot provide clear policy guidance as to whether economies with low education levels should foster FDI and exports in low-skill sectors or put more emphasis on the prior or simultaneous development of human capital and capabilities.

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*ADB recognizes "China" as the People's Republic of China.

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APPENDIX: Export Data for the 2 × 2 Economy Investigation

PAKISTAN		2003			2014	
Product Code and Description	**Rank**	**% of Economy Exports**	**% of World Exports**	**Rank**	**% of Economy Exports**	**% of World Exports**
1711 - Preparation and spinning of textile fiber; weaving of textiles	1	26.2%	3.8%	1	20.2%	4.3%
1810 - Manufacture of wearing apparel, except fur apparel	2	21.0%	1.5%	2	17.3%	1.3%
1721 - Manufacture of made-up textile articles, except apparel	3	20.0%	9.0%	3	16.1%	6.0%
1531 - Manufacture of grain mill products	4	5.7%	4.9%	4	9.8%	6.1%
1730 - Manufacture of knitted and crocheted fabrics and articles	6	2.4%	0.4%	5	3.2%	0.7%
1911 - Tanning and dressing of leather	7	2.0%	1.5%	6	2.2%	2.4%
2694 - Manufacture of cement, lime, and plaster	32	0.2%	0.3%	7	2.1%	4.9%
0113 - Growing of fruit, nuts, beverage, and spice crops	14	0.9%	0.2%	8	2.0%	0.4%
2320 - Manufacture of refined petroleum products	8	2.0%	0.1%	9	1.7%	0.1%
0111 - Growing of cereals and other crops n.e.c.	10	1.4%	0.2%	10	1.5%	0.2%
3693 - Manufacture of sports goods	5	2.8%	2.6%	11	1.5%	1.4%
1722 - Manufacture of carpets and rugs	9	1.9%	2.4%	24	0.5%	0.8%
Top 10 export goods' share of total economy exports		85.4%			76.3%	

BANGLADESH		1989			2011	
Product Code and Description	**Rank**	**% of Economy Exports**	**% of World Exports**	**Rank**	**% of Economy Exports**	**% of World Exports**
1810 - Manufacture of wearing apparel, except fur apparel	1	33.5%	1.6%	1	48.3%	4.0%
1730 - Manufacture of knitted and crocheted fabrics and articles	12	0.8%	0.1%	2	30.9%	6.2%
1721 - Manufacture of made-up textile articles, except apparel	3	11.2%	4.6%	3	4.3%	1.8%
1711 - Preparation and spinning of textile fiber; weaving of textiles	5	10.7%	0.6%	4	3.3%	0.7%
1512 - Processing and preserving of fish and fish products	2	12.4%	1.4%	5	2.4%	0.6%
0111 - Growing of cereals and other crops n.e.c.	6	6.8%	0.4%	6	1.6%	0.1%
1920 - Manufacture of footwear	32	0.0%	0.0%	7	1.4%	0.3%
1911 - Tanning and dressing of leather	4	10.7%	5.3%	8	1.3%	1.5%
2320 - Manufacture of refined petroleum products	60	0.0%	0.2%	9	1.0%	0.0%
9999 - Goods not elsewhere classified	18	0.2%	0.0%	10	0.8%	0.1%
2412 - Manufacture of fertilizers and nitrogen compounds	7	3.7%	1.3%	13	0.3%	0.1%
1549 - Manufacture of other food products n.e.c.	8	1.8%	0.7%	39	0.0%	0.0%
2924 - Manufacture of machinery for mining, quarrying, and construction	9	1.7%	0.2%	58	0.0%	0.0%
0122 - Other animal farming; production of animal products n.e.c.	10	1.6%	1.2%	94	0.0%	0.0%
Top 10 export goods' share of total economy exports		94.2%			95.4%	

MALAYSIA	1989			2014		
Product Code and Description	**Rank**	**% of Economy Exports**	**% of World Exports**	**Rank**	**% of Economy Exports**	**% of World Exports**
3210 - Manufacture of electronic valves and tubes and other electronic components	1	15.7%	10.6%	1	17.9%	7.8%
1110 - Extraction of crude petroleum and natural gas	2	14.8%	16.8%	2	12.9%	3.6%
2320 - Manufacture of refined petroleum products	11	1.5%	4.2%	3	8.7%	2.7%
1514 - Manufacture of vegetable and animal oils and fats	3	9.1%	25.5%	4	6.9%	12.8%
3000 - Manufacture of office, accounting, and computing machinery	18	1.0%	0.5%	5	5.9%	2.9%
3230 - Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	4	8.3%	5.6%	6	3.2%	3.4%
2411 - Manufacture of basic chemicals, except fertilizers and nitrogen compounds	17	1.0%	0.7%	7	2.9%	1.7%
2720 - Manufacture of basic precious and nonferrous metals	9	2.3%	1.6%	8	2.5%	1.0%
2519 - Manufacture of other rubber products	10	1.6%	9.4%	9	2.1%	8.0%
3220 - Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	20	0.9%	1.5%	10	2.0%	1.2%
0200 - Forestry, logging, and related service activities	5	6.5%	52.4%	45	0.3%	3.4%
0111 - Growing of cereals and other crops n.e.c.	6	5.9%	7.0%	28	0.6%	0.6%
2010 - Sawmilling and planing of wood	7	5.1%	12.4%	32	0.5%	2.6%
1810 - Manufacture of wearing apparel, except fur apparel	8	2.8%	2.6%	31	0.5%	0.3%
Top 10 export goods' share of total economy exports		72.2%			65.2%	

THAILAND		1989			2014	
Product Code and Description	Rank	% of Economy Exports	% of World Exports	Rank	% of Economy Exports	% of World Exports
3410 - Manufacture of motor vehicles	44	0.3%	0.0%	1	8.2%	2.1%
3000 - Manufacture of office, accounting, and computing machinery	6	5.4%	2.2%	2	8.0%	3.7%
2320 - Manufacture of refined petroleum products	133	0.3%	0.6%	3	4.5%	1.3%
3210 - Manufacture of electronic valves and tubes and other electronic components	8	3.9%	2.1%	4	4.4%	1.9%
2413 - Manufacture of plastics in primary forms and of synthetic rubber	47	0.3%	0.3%	5	4.3%	3.9%
2411 - Manufacture of basic chemicals, except fertilizers and nitrogen compounds	50	0.3%	0.1%	6	3.6%	2.0%
0111 - Growing of cereals and other crops n.e.c.	1	11.0%	10.3%	7	3.5%	3.5%
3430 - Manufacture of parts and accessories for motor vehicles and their engines	59	0.2%	0.1%	8	3.4%	2.0%
3230 - Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	11	2.2%	1.2%	9	2.9%	3.0%
3691 - Manufacture of jewelry and related articles	5	5.6%	12.2%	10	2.9%	3.0%
1810 - Manufacture of wearing apparel, except fur apparel	2	10.2%	7.5%	30	1.0%	0.7%
1512 - Processing and preserving of fish and fish products	3	9.6%	15.8%	11	2.8%	6.7%
1531 - Manufacture of grain mill products	4	9.4%	59.5%	13	2.5%	14.6%
1542 - Manufacture of sugar	7	3.9%	27.6%	24	1.2%	10.8%
1711 - Preparation and spinning of textile fiber; weaving of textiles	9	3.0%	2.6%	35	0.8%	1.5%
1920 - Manufacture of footwear	10	2.7%	5.1%	57	0.3%	0.6%
Top 10 export goods' share of total economy exports		64.7%			45.6%	

n.e.c. = not elsewhere classified.
Source: UN Comtrade, ISIC Revision 3 HS 1988/92 (accessed through World Integrated Trade Solution).