China and the Exports of Other Asian Countries

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Abstract: We analyze the impact of China's growth on the exports of other Asian countries, distinguishing China's demand for imports from its penetration of export markets. We account for the endogeneity of Chinese exports by applying instrumental variables in a gravity model with country-pair fixed-effects. We find that China's crowding-out effect is felt mainly in markets for consumer goods and hence by less-developed Asian countries, not in markets for capital goods or by the more advanced Asian economies. Meanwhile, China has been sucking in imports from its Asian neighbors, but this effect is mainly felt in markets for capital goods. Hence, more and less developed Asian countries are being affected very differently by China's rise. JEL no. E5, F4
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1 Introduction

China's integration into the world economy is one of the most important developments affecting the structure and evolution of the global system at the dawn of the 21st century. Over the last 20 years, China has grown at a rate of nearly 10 percent per annum, driven primarily by the expansion of the modern, industrial, export-oriented sector. With some 20 million Chinese workers moving from rural underemployment to the modern sector annually, the impact is akin to adding another middle-sized industrial economy to the world economy each year. And with between 200 million and 300 million workers still to be reallocated from rural underemployment, this is

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not simply a one-time shock but an ongoing process that should continue for a decade and more.[1]

China is now the world's sixth largest economy when its output is measured at market exchange rates; at purchasing power parities it is of course larger still.[2] It is the fourth largest trader. Reflecting its development strategy, its exports have grown even faster than its economy, at rates in excess of 20 percent per annum. As a result China's share of world trade has risen from less than 1 percent two decades ago to 6 percent today. Its market share in Japan (that is, the share of Japanese imports originating in China) more than tripled between 1990 and 2002, rising from 5.1 percent to 18.3 percent. The same is true of its market share in the United States, which rose from 3.2 percent in 1990 to 11.1 percent in 2002. The same is again true, albeit starting from a lower base, of the European Union, where the comparable figures are 2.0 and 7.5 percent.[3]

The structure of China's exports has been changing as well, away from the clothing, footwear, other light manufactures and fuels that dominated its trade in the 1980s and early 1990s, toward office machinery, telecommunications, furniture, and industrial supplies in the late 1990s and automated data processing equipment and consumer electronics in recent years. Along with the growth of Chinese exports has come the rapid growth of Chinese imports. What was once a chronic trade surplus has recently become a deficit, reflecting China's growing demand for primary commodities (such as crude oil and copper), intermediate inputs (components for electronic products and other consumer durable goods), and capital goods (in consequence of the economy's high investment rate).

The effects of these trends are likely to be felt especially intensely by China's Asian neighbors. Geographical proximity, shared borders, linguistic commonalities, and the existence of extensive networks of overseas Chinese are among the reasons to expect large amounts of trade between China and the rest of Asia. Similarities in stages of economic development, factor abundance, technological capability, and production costs

[1] Of course, there are some who warn of the existence of serious challenges, such as the condition of the banking system and the state enterprises, that may interrupt the growth process, as well as constraints like relatively low levels of human capital that may pose even more persistent problems. We do not address these questions in the present paper.

[2] Insofar as the focus of this discussion is China's impact on other economies and the latter is felt primarily through channels like trade, market rather than purchasing power parity exchange rates are the appropriate basis for comparison (a point made by IMF (2004)).

[3] These figures are adjusted for intra-EU trade.

mean that some other Asian economies will compete head to head with China in third markets. Thus, China's emergence may intensify the competitive pressure felt by other Asian economies, slow the growth of their exports, and challenge the sustainability of high growth more generally. In other cases, different stages of economic development, technological capability, and comparative advantage may mean that China's exports and other Asian countries' exports are complements rather than substitutes. To the extent that China's exports are still dominated by consumer goods, the country does not compete directly in third markets with advanced Asian economies like Japan and South Korea that export machinery and equipment. In addition, China's modern, export-oriented manufacturing sector relies on imported raw materials, energy, components, and capital equipment. Thus, the faster the country's exports grow, the faster its imports of materials, components, and equipment from its neighbors will also grow. The most that can be said at this level of generality is that the impact of China's export growth on the exports of other Asian economies is unclear.

These are the questions motivating the analysis in this paper. We estimate the impacts in question using econometric methods and an identification strategy that explicitly acknowledges the potential endogeneity of Chinese exports. We distinguish the impact of China's growth on its own imports from other Asian countries, on the one hand, from its impact on the exports of other Asian countries to third markets, on the other. We distinguish the impact of China's growth on other Asian countries' exports of capital goods, intermediates, and consumer goods.

We find that the crowding out of other Asian countries' exports to third markets by China's exports is limited to consumer goods at this stage. In practice this implies that the effect of Chinese growth is negative for low-income Asian countries that export mainly consumer goods and feel the brunt of Chinese competition in third markets but not for high-income Asian countries that export mainly capital goods and benefit from China's voracious appetite for imported machinery and equipment. The remainder of the paper proceeds as follows: Section 2 first reviews the literature. Section 3 describes the data and develops the econometric methodology. Section 4 discusses the basic regression results. Section 5 distinguishes capital goods, intermediates, and consumer goods, while Section 6 describes China's own imports. Section 7 then examines the net effect of China's growth. Section 8 performs sensitive analysis. Section 9 discusses policy implication and concludes the paper.

2 Previous Studies

There have been few previous analyses of these questions. The study most similar to ours is Ahearne, Fernald, Loungani, and Schindler (2003). These authors use annual data spanning the period 1981–2001 for four newly industrialized economies (NIEs) (Korea, Singapore, Taiwan, and Hong Kong) and four (additional) ASEAN members (Indonesia, Malaysia, Philippines, and Thailand), considering the impact of China's exports on the exports of these neighboring countries. They regress the growth of their exports on the growth of foreign incomes and the change in the country's real exchange rate, and then add China's real export growth as an additional regressor to these export equations.[4] While the coefficient on Chinese exports tends to be positive, suggesting complementarities between its exports and those of its Asian neighbors, that effect rarely approaches statistical significance at standard confidence levels. On this basis the authors conclude that there is "little evidence that increases in China's exports reduce the exports of other emerging Asian economies. Indeed, it appears that China's exports and exports of the other countries are *positively* correlated."[5]

The question has also been addressed in the context of China's WTO accession. China's accession to the WTO is modeled as a liberalization of its trade regime that increases its propensity to import and export. Thus, Ianchovichina and Walmsley (2005) calibrate and simulate a multicountry, multisector model of international trade, and find that China's WTO accession, while increasing the country's own exports, reduces the exports of Vietnam, the Philippines, Thailand, Indonesia, and Malaysia (due mainly to the negative impact on their textile and apparel sales). They find that WTO accession has a positive impact on the exports of Japan and the NIEs (Hong Kong, South Korea, Singapore, and Taiwan), due mainly to the increase in their exports to China of high-quality textile and electronics inputs (along with miscellaneous exports of processing industries). As they summarize their results, "Japan and the newly industrialized economies in East Asia will also benefit from China's accession to the WTO...As important suppliers of materials to China, these countries will observe an improvement in their terms of trade and returns to capital"(Ianchovichina and Walmsley 2005: 11). In both Japan and the NIEs, the projected increases in production

[4] Country fixed-effects are also included in the regressions, as are a lagged dependent variable and lagged independent variables in some cases.
[5] Ahearne et al. (2003: 21).

are driven mainly by expansion in exports to China. On the other hand, their simulations suggest a decline in exports (mainly of textiles and apparel) and a reduction in GDP relative to baseline levels in East Asia's developing countries.

Similarly, Yang and Vines (2000) simulate a multisector, multicountry model with differentiated products as a way of analyzing the impact of China's growth on exports from other Asian countries, finding that the exports of the ASEAN countries drop slightly while those of Japan and the NIEs both rise. These overall effects are the sum of positive effects on exports to China itself and negative effects on exports to third markets, which differ in size depending on the Asian exporter concerned.

Yet another simulation is IMF (2004), which uses a computable general equilibrium model designed to capture the geographical and sectoral structure of trade flows. This analysis points to a small negative impact on the exports and output of all regions. In terms of output, this negative effect (measured as the percentage deviation from the values obtaining in the slow-Chinese-growth baseline) is largest for the Middle East and North Africa and smallest for the advanced economies. The ASEAN economies experience a somewhat larger than average impact, while the NIEs and South Asian economies show a somewhat smaller than average impact. The precise effects vary by sector and country. For example, countries that rely heavily on exports of textiles and clothing, labor-intensive manufactures in which China also has a comparative advantage tend to experience particularly large negative effects.

The limitations of the literature will now be apparent. The results of simulation studies depend on precisely how the models in question are calibrated. Econometric studies have not yielded precise estimates, leading investigators either to draw inferences from coefficients that are not significantly different from zero or to suggest on the basis of their failure to identify a significant effect that one does not exist. This gives us more than enough motivation to reconsider the question.

3 Methodology

The framework for our analysis is that familiar workhorse of empirical international economics, the gravity model. Use of the gravity model has been motivated in the literature in two ways. Some authors (Anderson 1979) seek to derive the estimating equation from an explicit theoretical model of in-

ternational trade in the presence of transactions costs. This approach yields a restrictive specification that can be used to test assumptions of the particular theoretical model. More commonly, authors appeal to the empirical robustness of the gravity model and employ it as a general framework for analyzing the role of a wide variety of different determinants of international trade (from the impact of trade unions to the impact of monetary unions) rather than as an effort to capture and test a particular trade-theoretic model. Thus, Rose (2004: 99) writes,

> "For those unfamiliar with the gravity model, it is a completely conventional device used to estimate the effects of a variety of phenomena on international trade. Unusually for economics, it is also a successful model, in two senses. First, the estimated effects of distance and output (the traditional gravity effects) are sensible, economically and statistically significant, and reasonably consistent across studies. Second, the gravity model explains most of the variation in international trade. That is, the model seems reliable and to fit the data well."

Rose and other authors have thus added a host of ancillary variables to the "traditional gravity effects" as a way of estimating their impact on bilateral trade flows. We follow this tradition.[6]

We consider bilateral flows between the 13 Asian exporting countries and all 180 importing countries. When no trade is recorded between a pair of countries, conventional practice in the gravity model literature, followed here, has been to simply drop these observations. While an argument can be made that this is a source of truncation bias, studies like Eichengreen and Irwin (1995) that have used Tobit and similar methods find that the impact on the estimated coefficients is minimal. In this paper, we use Tobit method as a check on the robustness of our results without noticeably affecting the findings.

Using a matrix of bilateral trade flows, we regress the log imports of country *i* from country *j* (say, of Denmark from South Korea) on the log

[6] Thus, we are not claiming to be testing a particular theoretical model of trade or to be deriving our estimating equation from that model. In practice, the fact is that the theoretical literature showing how the gravity specification could be derived from the standard models of international trade—under restrictive assumptions—followed rather than preceding the development of a large literature estimating the standard specification. This is all the more reason to motivate the present exercise in terms of the robustness of the empirical formulation rather than in terms of a specific theoretical model.

GDPs of the two countries, the log per capita GDPs of the two countries, the log distance between them, combined land area, land lockedness, number of islands, common language, common colonizer, and whether the countries in question were ever in a colonial relationship.

We also include a measure of China's exports to the same market (in the case of the present example, Denmark). In addition, we model separately China's imports from other Asian economies. It is important to recognize the potential endogeneity of China's exports. A variety of unobservable global factors will plausibly affect the error term and therefore Korean exports to Denmark while also affecting China's exports to Denmark, creating a correlation between the error term and the key explanatory variable. A standard treatment for this type of problem is instrumental variables, the difficulty being the paucity of plausible instruments that is the bane of empirical macroeconomics.

Fortunately, in the present context the gravity model suggests an instrument that is both plausibly exogenous and strongly correlated with Chinese exports. The obvious instrument, in other words, is the distance between China and the country that is the destination of its exports.[7]

We also included time fixed-effects. In addition, Anderson and Marcouiller (2002) suggest that it is important to control for a country's multilateral resistance to trade. Below we follow Anderson and Marcouiller's suggestion for how to deal with this problem, adding country-pair specific institutional variables such as measures of country risk. We utilize indices from the International Country Risk Guide (ICRG), which provides measures of political, economic, and financial risk. Here we focus on its measure of political risk, which seeks to capture bureaucratic quality, corruption, democratic accountability, ethnic tensions, external conflict, governmental stability, internal conflict, investment profile, law and order, military in politics, religious tension, and socioeconomic conditions. The index runs from 0 to 100, with higher values implying lower risk.[8] In the section on

[7] Note the parallel between this approach and previous studies that have added a measure of remoteness (the distance between the importing country and exporting countries *other than* the exporting country that is the other member of the bilateral pair currently under consideration). In effect, we are focusing on remoteness from China as a way of identifying the impact of China's exports on the exports of other countries.

[8] This index of political risk tends to vary significantly over time for China's emerging-market trading partners but less for the advanced-industrial countries. As for China itself, between 1990 to 2002, the period covered here, the index varies from 56 to 75. For additional details on the index see http://www.prsgroup.com/commonhtml/methods.html#_International_Country_Risk.

sensitivity analysis below, we also include country and country-pair fixed-effects.[9]

4 Basic Regression Results

Our data on trade flows are from the IMF's *Direction of Trade Statistics*. They provide us with bilateral merchandise trade between 180 IMF trading entities through 2003.[10] CIF imports are recorded in millions of U.S. dollars. We deflate imports by the U.S. CPI for all urban consumers.[11] Real GDP and GDP per capita (in constant 1995 U.S. dollars) are obtained from the World Bank's *World Development Indicators*. Most of our other country-specific variables, such as land area and language, are from Rose (2002).[12]

We start with the equations for the impact of China's exports on the exports of other Asian countries. These cover the period 1990–2003.[13] Recall that we include here observations for all bilateral trade flows between Asian countries and their trading partners (South Korea's exports to the United States, South Korea's exports to Denmark, etc.), excluding of course the observations for China's exports and imports, which are treated separately in Section 6 below.

Table 1a shows the results of estimating the model with the constraint that the basic gravity-model coefficients are the same for all importing and exporting countries. Table 1b shows the results of the first-stage regression for China's exports, which is useful for gauging goodness of fit and will be handy for counterfactual simulations. Note that standard econometric methodology dictates including in the first stage not just the distance from China to the third market but also the other exogenous variables from the second stage.

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[9] There we construct a time-varying version of our instrumental variable, the economic distance from China to its export markets, which is what permits us to add these country and country-pair dummy variables.

[10] Below we also use the United Nations trade database, whose country coverage is somewhat more limited (149 versus 180 countries) but which permits us to disaggregate capital goods, intermediates, and consumer goods.

[11] 1982–1984 = 100; from http://www.bls.gov/data/home.htm.

[12] The distance measure, on which we comment further below, is from Rose's Website as well.

[13] While data exist for earlier years, prior to 1990 China was significantly less integrated into the world economy, making it unlikely that the information content of these earlier data will shed useful light on current concerns. Below we discuss how the results change when we limit the analysis to an even shorter period.

Table 1a: *The Impact of China's Exports on Asian Countries' Exports to Third Markets (1990–2003)*

	IV		OLS	
	Coef.	St. err.	Coef.	St. err.
China's exports (log)	−0.06	0.04	0.42	0.01
GDP of importing country (log)	0.89	0.04	0.46	0.01
GDP per capita of importing country (log)	0.11	0.01	0.11	0.01
GDP of exporting country (log)	0.66	0.01	0.64	0.01
GDP per capita of exporting country (log)	0.40	0.02	0.40	0.02
Product of land areas	0.00	0.01	0.03	0.01
Distance (log)	−1.37	0.04	−0.92	0.02
Common language dummy	0.45	0.03	0.30	0.03
Number of land locked (0/1/2)	−0.74	0.04	−0.56	0.03
Number of islands (0/1/2)	−0.48	0.02	−0.45	0.02
Land border dummy	−0.43	0.16	0.08	0.11
Common colonizer post 1945	0.86	0.04	0.76	0.04
Pairs ever in colonial relationship	1.07	0.07	1.09	0.11
Political risk for importing country	0.011	0.001	0.007	0.001
Political risk for exporting country	0.008	0.002	0.008	0.001
Year 1990	–	–	–	–
Year 1991	0.08	0.07	0.02	0.06
Year 1992	0.16	0.07	0.00	0.06
Year 1993	0.08	0.07	−0.16	0.06
Year 1994	−0.01	0.07	−0.29	0.06
Year 1995	0.03	0.07	−0.31	0.06
Year 1996	0.00	0.07	−0.34	0.06
Year 1997	−0.08	0.08	−0.46	0.06
Year 1998	0.03	0.08	−0.44	0.06
Year 1999	−0.08	0.08	−0.54	0.06
Year 2000	−0.10	0.08	−0.64	0.06
Year 2001	−0.08	0.08	−0.68	0.06
Year 2002	−0.13	0.09	−0.81	0.06
Year 2003	−0.07	0.10	−0.92	0.06
Constant	−0.38	0.37	−3.71	0.23
Number of observations	15,619		15,619	
R-square	0.78		0.81	

The gravity model fits the data well. Exports rise with the GDP and GDP per capita of the importing and exporting countries.[14] They fall with distance and with the combined land mass of the trade partners (geographically

[14] The correlation between GDP and GDP per capita for a given country might be high in the sample period. But across all the countries in our sample, the correlation between these two variables is only at 0.44 (due to the difference of population size). In a panel

Table 1b: *First-Stage Estimation: Determinants of China's Exports to Third Markets (1990–2003)*

	Coef.	Std. err.
GDP of importing country (log)	0.86	0.01
GDP per capita of importing country (log)	0.03	0.01
GDP of exporting country (log)	0.05	0.01
GDP per capita of exporting country (log)	−0.04	0.01
Product of land areas	−0.03	0.01
Distance	−0.15	0.03
Common language dummy	0.33	0.02
Number of land locked (0/1/2)	−0.43	0.03
Number of islands (0/1/2)	−0.06	0.02
Land border dummy	−0.52	0.09
Common colonizer post 1945	0.31	0.03
Pairs ever in colonial relationship	−0.01	0.09
Political risk for importing country	0.01	0.001
Political risk for exporting country	0.01	0.001
Year 1990	–	–
Year 1991	0.12	0.05
Year 1992	0.35	0.05
Year 1993	0.50	0.05
Year 1994	0.59	0.05
Year 1995	0.70	0.05
Year 1996	0.72	0.05
Year 1997	0.81	0.05
Year 1998	1.00	0.05
Year 1999	0.95	0.05
Year 2000	1.15	0.05
Year 2001	1.26	0.05
Year 2002	1.42	0.05
Year 2003	1.79	0.05
China's distance to importing countries	−0.98	0.03
Constant	8.34	0.19
Number of observations	15,619	
R-square	0.82	

large countries tending to do more internal trade and less international trade, other things equal). Land-locked countries and countries spread across multiple islands trade less, while countries presently or previously in a colonial relationship, that share a common border, and that share a common language trade more. All of these effects except for common land

regression, it is the correlation across all countries that matters more, rather than the correlation within a single country.

border are significantly different from zero at the 95 percent confidence level. The variable of particular interest, the fitted value or exogenous component of Chinese exports to the same market, enters with a negative coefficient of 0.06 and a t-statistic of 1.63 (column (1) of Table 1a). (Note that we report robust standard errors corrected for heteroskedasticity, which otherwise would likely be a problem in a panel made up of country pairs of such very different size.) This tells us that, other things equal, a 10 percent increase in Chinese exports to a particular market results in a 0.6 percent decline in the sales of the competing Asian country in that market. The effect does not differ significantly from zero at standard confidence levels.[15]

It is also interesting to contrast the instrumental-variables results in columns (1) and (2) with the OLS results in column (3) and (4), which we provide for illustrative purposes only. Clearly, instrumental variables make an important difference. In column (3) the coefficient on China's exports is positive. This is exactly the bias one would expect due to a common omitted shock like an improvement in consumer sentiment worldwide, which should be expected to increase both the exports of China and other countries, introducing a positive correlation between the key independent variable and the error term.

Since we are not deriving our estimating equation from a particular model of international trade, we do not put a particular structural interpretation on this coefficient. An obvious interpretation is that the growing competitiveness of Chinese exports is causing consumers in other parts of the world to substitute away from other suppliers in favor of China. But one can imagine other interpretations, for example that the pressure of Chinese exports is causing importing countries to invoke antidumping and other protectionist measures that disproportionately affect other suppliers. Our nonstructural specification does not identify the mechanism.

On the other hand, this specification should capture second-round or general-equilibrium effects. Imagine for example that the growth of China's exports to North America causes the United States to impose quotas and antidumping duties on China (as it has). This might then cause additional Chinese exports to be diverted to EU countries (Denmark in the example above), further crowding out the exports of other Asian countries (South

[15] It may appear surprising that a number of the time dummies enter with negative coefficients, since China's exports have been rising so strongly over time, but this may be telling us that other variables are more than fully capturing the expansion of its trade. In sensitivity analysis below we find that the results are essentially the same when we drop the time dummies.

Korea in the example above) to Europe. But both the first-round effect (the initial increase in Chinese exports to Denmark and its impact on Korea's exports to that same market) and the second-round effect (the further diversion of Chinese exports to Denmark due to U.S. antidumping duties) should be captured by our formulation.

5 Distinguishing Capital Goods, Intermediates, and Consumer Goods

Much of our intuition derives from the idea that China's growth has different implications for exporters of capital goods, intermediate goods, and consumer goods. If this is what is driving our results, then we should examine this issue directly. Unfortunately, IMF data do not disaggregate trade in this way. In this section we therefore utilize the United Nations' disaggregated trade database, which allows us to do so. The cost is somewhat less complete geographical coverage.[16] We first replicated our previous analysis using the UN data. In the benchmark estimates of Table 1, the coefficient on China's exports in the second-stage changes from −0.06 to 0.03, but neither coefficient is significantly different from zero (with a t-statistic of 0.84). The standard gravity-model variables also continue to perform nicely. (In other words, the coefficients on the other variables in Table 1 are similarly little changed.) The UN data mainly miss out a number of small island countries and poor African economies. Evidently, their trade is not sufficiently important to noticeably modify our results when it is dropped.

We divided commodity exports into capital goods, consumer goods, and intermediates (and other products) in the following way. The UN data are classified on the basis of the second revision of the Standard International Trade Classification (SITC 2). Capital goods include machinery and transport equipment (a subset of group 7 in SITC 2). Consumption goods include food (group 0), beverages and tobacco (group 1), miscellaneous manufactured articles (group 8), television and radio receivers (7.6.1, 7.6.2, and 7.6.3), passenger motor vehicles and cycles (7.8.1 and 7.8.5), and medicinal and pharmaceutical products (5.4). All the remaining goods (groups 2, 3, 4, 5, 6 and 9) are classified as intermediates.

Here we focus on the results for all importers and exporters combined in order to limit problems of multicolinearity. Table 2 reports three equations,

[16] The sample size for the IMF data is 15,619, while that for the UN data is 12,733.

Table 2: *The Impact of China's Exports on Asian Countries' Exports to Third Markets (1990–2003)*

	Consumer goods		Intermediates		Capital goods	
	Coef.	St. Err.	Coef.	St. Err.	Coef.	St. Err.
China's exports	−0.19	0.05	0.56	0.06	0.25	0.08
GDP of importing country	0.95	0.05	0.47	0.06	0.62	0.08
GDP per capita of importer	0.27	0.02	−0.02	0.02	0.13	0.03
GDP of exporting country	0.69	0.01	0.73	0.02	0.83	0.02
GDP per capita of exporter	0.21	0.02	0.44	0.02	0.82	0.03
Product of land areas	0.02	0.01	0.06	0.01	0.05	0.01
Distance	−1.35	0.06	−0.88	0.07	−0.97	0.10
Common language dummy	0.43	0.04	0.12	0.04	0.65	0.05
Number of land locked (0/1/2)	−0.42	0.05	−0.43	0.05	−0.28	0.06
Number of islands (0/1/2)	−0.45	0.03	−0.47	0.03	−0.18	0.04
Land border dummy	−1.00	0.20	0.24	0.18	0.43	0.30
Common colonizer post 1945	0.77	0.06	1.18	0.06	0.94	0.08
Pairs ever in colonial relation	1.26	0.08	1.08	0.08	1.52	0.14
Political risk for importer	0.02	0.002	0.01	0.002	0.01	0.002
Political risk for exporter	0.01	0.002	0.01	0.002	0.04	0.003
Year 1990	–	–	–	–	–	–
Year 1991	0.07	0.09	−0.06	0.09	−0.03	0.10
Year 1992	0.14	0.09	−0.15	0.08	−0.14	0.11
Year 1993	0.09	0.09	−0.26	0.08	−0.37	0.11
Year 1994	0.18	0.09	−0.54	0.09	−0.62	0.12
Year 1995	0.20	0.10	−0.53	0.09	−0.72	0.14
Year 1996	0.13	0.09	−0.65	0.09	−0.67	0.15
Year 1997	0.06	0.10	−0.84	0.10	−0.85	0.17
Year 1998	0.15	0.10	−0.70	0.10	−0.70	0.18
Year 1999	0.02	0.09	−0.89	0.09	−0.65	0.17
Year 2000	−0.07	0.10	−1.04	0.10	−0.70	0.19
Year 2001	−0.03	0.10	−1.02	0.10	−0.69	0.21
Year 2002	−0.02	0.11	−1.14	0.10	−0.86	0.22
Year 2003	0.09	0.12	−1.20	0.12	−1.00	0.26
Constant	14.27	1.03	−0.03	1.31	−3.02	1.68
Number of observations	12,733		12,463		11,360	
R-square	0.72		0.75		0.74	

one for exports of capital goods, one for exports of intermediate goods, and one for exports of consumer goods. As before, we now include the distance from China to the third country export market in the first-stage regression.

The coefficients for China's exports are positive and statistically different from zero in the equations for capital goods and intermediates. (The

respective t-statistics are 3.5 and 10.0.) In contrast, there is a large negative coefficient in the equation for consumer goods (−0.19 with a t-statistic of 3.5). From an econometric point of view, this is consistent with our earlier results for total trade; our earlier coefficient of 0.03 is effectively a weighted average of the large weight of consumer goods exports in total exports and the small weight for the other two categories of exports.[17]

6 China's Imports

The last set of regressions needed to construct the counterfactual is for the impact of Chinese growth on Chinese imports.[18] Once more we base our estimates on the gravity model framework (where the volume of Chinese imports depends on GDP and GDP per capita in the exporting country and GDP in China).[19]

One problem with applying the gravity model in this context is that the distance variable—calculated here as the distance between country geographic centers—enters insignificantly or with the wrong (positive) sign. A little reflection reveals why: distance from other Asian countries to China's geographic center is not a meaningful measure of economic distance, given that much of the country's trade-relevant economic activity is concentrated not at its center but along the coast. Bangladesh is 11 percent closer than Vietnam to China's center, but Vietnam is much closer to the Pearl River Delta, where much of China's export-relevant economic activity takes place. Differences in the distance between China's geographic center and, say, Bangkok versus Copenhagen do in fact tell us something about the relative (transportation and information) costs of exporting from China to Thailand versus Denmark. This is why distance is a powerful instrument in the first-stage regressions using the global sample, as reported above. But in the context of China's imports from its Asian neighbors, the distance between geographic centers works less well. Hence, in the equations for China's imports from other Asian economies, we drop the distance variable.

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[17] The shares of consumer, intermediate and capital goods in total exports are 56, 24, and 20 percent, respectively.

[18] Estimating the determinants of China's imports is difficult in any case for an economy undergoing such rapid structural change.

[19] We drop China's GDP per capita here because of the high correlation between China's GDP and GDP per capita and consequent multicolinearity.

The results are in Table 3.[20] The elasticity of Chinese imports with respect to Chinese GDP is on the order of one when the equation is estimated over the entire period 1990–2003; this is more or less true for every Asian exporter. But when the sample is limited to the second half of the period (1997–2003), we see considerably larger Chinese import elasticities of demand, in particular for high-income Asian exporters of capital goods and components (Japan, Korea), for Asian exporters of energy and raw materials (such as Indonesia) and, interestingly, for India. In contrast, this elasticity is lowest for low-income, relatively resource-poor Asian countries like Bangladesh, Sri Lanka, and Cambodia.

Table 3: *China's Imports from Asian Countries, Disaggregated by Exporting Country*

	1990–2003		1997–2003	
	Coef.	Std. err.	Coef.	Std. err.
Log of China's GDP*Japan	0.9	0.4	3.1	0.7
Log of China's GDP*South Korea	1.2	0.3	2.8	0.5
Log of China's GDP*Singapore	1.0	0.3	2.1	0.5
Log of China's GDP*Indonesia	1.5	0.3	2.9	0.5
Log of China's GDP*Malaysia	1.3	0.2	2.4	0.4
Log of China's GDP*Philippines	1.4	0.2	2.5	0.4
Log of China's GDP*Thailand	1.3	0.2	2.6	0.5
Log of China's GDP*Bangladesh	1.3	0.2	2.2	0.5
Log of China's GDP*Cambodia	1.3	0.1	1.7	0.3
Log of China's GDP*Sri Lanka	1.1	0.2	1.7	0.3
Log of China's GDP* Pakistan	1.5	0.2	2.5	0.5
Log of China's GDP* Vietnam	1.6	0.2	2.4	0.4
Log of China's GDP*India	1.5	0.3	3.1	0.7
Log of GDP of exporting country	0.5	0.6	−2.1	1.3
Log of GDP per capita of exporting country	1.6	0.7	1.8	1.4
Constant	−21.2	2.6	−15.3	4.8
Number of observations	179		91	
R-square	0.95		0.98	

Table 4 reports separate equations for Chinese imports of capital goods, intermediate goods, and consumer goods. The income elasticities of demand for capital goods, intermediates, and consumer goods are all positive, as expected. But the income elasticity for capital goods is especially large, in

[20] In Table 3, we are again using IMF trade data.

Table 4: *China's Imports from Asian Countries, Disaggregated by Commodity Type, (1990–2003)*

	Capital goods		Consumer goods		Intermediates	
Japan	2.42	(0.71)	1.16	(0.44)	0.13	(0.37)
Bangladesh	1.35	(0.40)	1.39	(0.25)	0.95	(0.21)
Cambodia	1.75	(0.26)	1.32	(0.16)	0.79	(0.14)
Sri Lanka	2.22	(0.30)	1.25	(0.19)	0.39	(0.16)
India	1.42	(0.64)	1.67	(0.40)	1.37	(0.34)
Indonesia	2.01	(0.49)	1.56	(0.31)	1.18	(0.26)
Korea	2.60	(0.54)	1.39	(0.34)	0.45	(0.29)
Malaysia	2.74	(0.43)	1.36	(0.27)	0.58	(0.23)
Pakistan	1.60	(0.42)	1.73	(0.26)	0.97	(0.22)
Philippines	2.30	(0.40)	1.47	(0.25)	0.83	(0.22)
Singapore	3.20	(0.57)	1.10	(0.36)	−0.03	(0.31)
Thailand	2.42	(0.44)	1.51	(0.28)	0.71	(0.24)
Vietnam	2.03	(0.35)	1.72	(0.22)	1.21	(0.19)

Note: Standard errors are in parentheses.

excess of two. This is consistent with the oft-heard observation that China's growth is good for suppliers of machinery and equipment.

7 Implications of China's Growth

We now use the preceding estimates to ask how each country's exports (to China, to third countries, and as a whole) are affected by a 10 percent increase in Chinese income. Note that this avoids the "fallacy of composition" problem in previous studies where the comparative-statics experiment is an increase in Chinese exports. These studies have been criticized (e.g. by Mayer 2003) for ignoring the fact that an increase in Chinese exports presumably reflects and results in an increase in Chinese incomes that also stimulates Chinese imports. Asking how an increase in China's exports will affect the global export market shares of other countries without recognizing that the underlying increase in Chinese incomes will also translate into an increase in that country's demands for imports from its trading partners neglects an important part of the question.

Our estimates are not subject to this problem, since the counterfactual here is an increase in Chinese GDP. We use our gravity model estimates to derive the implications of that GDP growth for China's exports and the impact they have in turn on the exports of its Asian neighbors to markets

other than China. The first-stage regressions tell us that a 10 percent increase in Chinese GDP is associated with a 12.4 percent increase in China's own exports; according to the disaggregated trade data, this breaks down into a 23.7 percent increase in its exports of capital goods, a 12.1 percent increase in its exports of consumer goods, and an 11.3 percent increase in its exports of intermediates. We then combine those results with our estimates of how China's export growth affects the third-market exports of its neighbors and how its income growth affects it imports from other Asian countries.[21]

We use the parameters estimated over the full period 1990–2003 with the trade data disaggregated into capital goods, intermediate goods, and consumer goods.[22] For China's own import demands, we use the different income elasticities for different exporting countries in Table 4. For other countries' import demands, we use the estimates based on the assumption that these parameters are the same for all exporters and importers, excepting of course China (as in Table 2).[23]

Table 5 shows the results. We report the percentage change in exports of capital goods, intermediates and consumer goods in the first three columns and the sum of the three effects—weighted by the country-specific share of each type of exports—for each Asian country. The numbers in each column are the sum of the direct effect of Chinese growth on China's demand for imports and the indirect effect, if any, in crowding out exports in third markets. For example, a 10 percent increase in Chinese income leads to a 4.3 percent increase in Japanese exports.

Table 5 shows a range of effects, both in terms of the sign of the change in exports and its magnitude. But there is a pattern to the effects. China's growth has a positive effect on the exports of high income Asian countries such as Japan, Singapore, and South Korea that are significant exporters of capital goods, a positive effect on the exports of middle income countries such as Malaysia and the Philippines that export a range of products, and a negative effect on the exports of low-income Asian countries such as Bangladesh, Cambodia, Sri Lanka, and Pakistan that are heavily dependent

[21] To be sure, this is not the end of the story. Presumably there will be induced changes in foreign GDPs, which will further affect these countries' imports and exports. The repercussions of these induced changes in output and trade will then presumably affect the development of China's output and trade. But these second-round effects will be small relative to the first-order effects that we add to previous analyses.

[22] Substituting the parameters for the shorter (post-1996) period only reinforces our results (see below).

[23] Given the multicolinearity problem, we regard these constrained estimates as more reliable.

Table 5: *Net Impact of China's Income Growth (1990–2003)*

	Capital goods	Consumer goods	Inter-mediates	Total
Japan	0.74	−0.16	0.57	0.43
Bangladesh	0.59	−0.23	0.65	−0.15
Cambodia	0.60	−0.23	0.66	−0.06
Sri Lanka	0.62	−0.23	0.63	−0.05
India	0.61	−0.21	0.67	0.23
Indonesia	0.70	−0.21	0.68	0.38
South Korea	0.79	−0.11	0.59	0.44
Malaysia	0.69	−0.21	0.63	0.46
Pakistan	0.63	−0.15	0.66	−0.04
Philippine	0.68	−0.21	0.65	0.43
Singapore	0.69	−0.20	0.56	0.54
Thailand	0.69	−0.20	0.64	0.28
Vietnam	0.62	−0.20	0.72	0.13

on the production and sale of consumer goods. This reflects the greater tendency for Chinese exports to compete with other countries' exports of consumer goods, together with the country's unusually high income elasticity of demand for intermediate and capital-goods imports—and the different product mixes of different countries.

A number of additional country-specific results are worth flagging. First, of all the Asian countries considered, Singapore enjoys the largest percentage increase in exports, mainly reflecting the stimulus felt by its capital-goods producers. Second, Indonesia experiences a positive effect despite a significant fall in consumer-goods exports, reflecting its dependence on commodity exports, including energy.[24] Third, the net impact on India is smaller than that on Bangladesh, Pakistan, and Sri Lanka, reflecting its more diversified product mix. All of these results are consistent with common sense and conventional wisdom.

8 Sensitivity Analysis

One reason to worry about the robustness of these results is structural change: given rapid changes in the composition and direction of Chinese

[24] Energy is included with intermediates in our calculations. Thus, for Indonesia the positive response of exports of intermediates to China essentially offsets the negative effect on Indonesian exports of consumer goods to third markets.

exports, third country effects could be different in earlier and later years. Our first set of sensitivity analyses, in Table 6, therefore replicates the preceding analyses for the second half of the sample period (1997–2003). This basically confirms the earlier analysis except that the differences in China's impact on Asian countries at different levels of development are now, if anything, even more pronounced.[25]

Table 6: *Net Impact of China's Income Growth (1997–2003)*

	Capital goods	Consumer goods	Inter-mediates	Total
Japan	1.85	−0.97	1.20	0.85
Bangladesh	1.58	−1.05	0.99	−0.91
Cambodia	1.58	−1.05	1.01	−0.84
Sri Lanka	1.61	−1.05	0.92	−0.64
India	1.63	−1.04	1.09	0.09
Indonesia	1.78	−1.04	1.10	0.43
South Korea	1.89	−0.86	1.32	0.97
Malaysia	1.73	−1.03	1.02	1.01
Pakistan	1.61	−0.96	1.02	−0.75
Philippine	1.75	−1.03	1.01	1.11
Singapore	1.70	−0.95	0.94	1.21
Thailand	1.76	−1.02	1.11	0.51
Vietnam	1.62	−1.04	1.15	−0.22

An earlier section noted that a number of the dummy variables for recent years enter, somewhat surprisingly, with negative coefficients. We therefore drop time dummies in a second set of sensitivity analyses.[26] Now we can use time-varying factors like China's GDP as an instrument in the first-stage equation, as suggested by the gravity model. Note that the dependent variable in the first-stage regression is China's exports to a particular market, Denmark for example, not its aggregate exports. While there are reasons for thinking that China's model of export-led growth involves causality running from export growth to GDP in addition to the other way around, it is less

[25] Vietnam is an example where the impact of Chinese competition on trade in consumer goods, capital goods, and intermediates alike is more pronounced in the more recent period. In conjunction with the economy's dependence on exports of consumer goods, this is enough to turn the overall effect from positive to negative.

[26] The VIF is also relatively high when we include the entire vector of time dummies, suggesting the existence of multicollinearity, which is another reason for reconsidering the results in the absence of these variables.

Table 7: *Net Impact of China's Income Growth (no time dummies)*

	Capital goods	Consumer goods	Inter-mediates	Total
Japan	0.22	−0.25	−0.02	0.03
Bangladesh	0.03	−0.32	0.01	−0.29
Cambodia	0.04	−0.32	0.08	−0.25
Sri Lanka	0.06	−0.33	−0.04	−0.26
India	0.05	−0.30	0.03	−0.13
Indonesia	0.18	−0.30	0.06	−0.06
Korea	0.29	−0.20	0.08	0.07
Malaysia	0.15	−0.31	0.01	0.00
Pakistan	0.08	−0.25	0.03	−0.21
Philippine	0.15	−0.31	0.02	0.01
Singapore	0.15	−0.29	−0.04	0.04
Thailand	0.15	−0.29	0.04	−0.07
Vietnam	0.07	−0.30	0.14	−0.14

plausible that China's aggregate GDP is significantly affected by its exports to Denmark. This justifies using China's GDP as an additional instrument. Results are in Table 7. Again our earlier findings appear to be robust: capital-goods exporters such as Japan and Korea benefit from China's growth, while consumer-goods exporters suffer.

As a further robustness check, we distinguish subgroups within consumer goods, capital goods, and intermediates. We disaggregate capital goods into components (759, 7649, 77579, 776, and 786 in SITC 2) and other capital goods; consumption goods into food (group 0 in SITC 2), beverages (group 1), manufactured consumer goods (group 8), electronics (751, 752, and 76 net of 7,649) and automobiles (78 net of 784); and intermediate goods into raw materials, energy and other intermediate products (energy includes group 3 in SITC 2, while non-energy raw materials includes group 2 in SITC 2).

The disaggregated results are broadly consistent with our basic model. Within consumer goods, China has a strong crowding-out effect on manufactured consumer goods but not on beverages, food, and electronics. Further disaggregating manufactured consumer goods into textiles and non-textiles, we find that the textile industry is the locus of China's crowding-out effect.[27] Within capital goods, China's exports of components, particularly

[27] A 10 percent increase of China's textile exports reduces other Asian countries' exports by 4 percent. However, the crowding-out effect of China on non-textile manufactured consumer goods is only 0.4 percent.

electronic components, strongly complement other Asian countries' exports of components.[28] But China's impact on other countries of other capital goods is much less pronounced. For the various subcategories of intermediates, China's exports are complementary to other countries' exports.

In the basic model, our instrumental variable is the distance from China to its export markets, which is not time varying. In a sense, we are relying on the cross-section variation of distance to identify changes over time in China's impact on other countries' exports. In a further robustness check we therefore constructed an alternative instrumental variable: the distance from China's three principal exporting provinces (Beijing, Shanghai, and Guangdong) to each export market, weighted by the relative importance of exports from each province.[29] Usefully for our purposes, these weights changed significantly overtime: the share of Shanghai increased from 29 in 1993 to 49 percent in 2003, while the share of Guangdong dropped from 62 to 43 percent. This shift reflected China's domestic reforms: Guangdong had the earliest special economic zones such as Shenzhen, while Shanghai has integrated rapidly into the world market particularly after Deng's trip to south China in 1992. Insofar as these changes reflected political decisions, the shift in weights can plausibly be taken as exogenous in the bilateral trade equation for third markets. As a result of the shift, the weighted distance had become longer (shorter) for half (half) of the countries from 1993 to 2003. Moreover, the changes in distance for some countries (about 10 percent) were larger than 5 percent.

We use this new instrument to analyze China's impact on the exports of third markets from 1992 to 2003. Note that substitution of this time-varying instrument also allows us to include country or country-pair fixed-effects to control for a country's multilateral resistance to trade, as in Anderson and Wincoop (2003). Therefore, we re-estimate the model with country-pair fixed-effects.[30] The new instrumental variable enters with a significantly negative coefficient in the first-stage estimation for the various commodity

[28] A 10 percent rise of China's component exports is associated with 3 percent rise of other Asian countries' exports.

[29] The weight is based on these provinces' exports of all commodities, rather than on their exports of subgroups such as consumer goods. Moreover, we do not have data on bilateral trade between these three provinces and their exporting markets. Instead, we have only data on annual total exports for each province.

[30] We get similar results if we add country fixed-effects instead of country-pair fixed-effects.

groups. Also reassuring is the fact that the R-squared in the first stage is reasonably large. All this suggests that time-varying distance as constructed here is a powerful instrumental variable. Table 8 presents the first- and second-stage results for textiles as an illustration. The key results carry over.

Table 8: *The Impact of China's Textile Exports on Asian Countries' Textile Exports to Third Markets (with country-pair fixed-effects, 1990–2003)*

	1st stage		2nd stage	
	Coef.	Std. err.	Coef.	Std. err.
GDP of importing country	6.17	0.26	2.67	0.89
GDP per capita of importer	−4.44	0.24	0.28	0.66
GDP of exporting country	−1.02	0.31	2.08	0.47
GDP per capita of exporter	0.77	0.34	−1.02	0.50
China's distance to importing countries (time-varying)	−6.12	0.60	–	–
China's textile exports	–	–	−0.37	0.14
Constant	72.9	5.72	−7.34	3.30
R-square	0.32		0.45	
Number of observations	10,851		10,851	

Note: Time fixed-effects are included though not reported.

In contrast, China now does not seem to have a significant negative impact on other countries' exports of beverages, food, electronics or manufactured consumer goods.[31] To explore this further, we disaggregated manufactured consumer goods (group 8) into its seven subgroups.[32] Again we find that China significantly crowds out other Asian countries' exports of textiles while having no significant negative effects for the other six subgroups.[33] This is plausible: textiles are labor intensive and are major exports of low-income Asian countries. For example, in the year 2002, 97 and 91 percent

[31] Previously, China's impacts on food and electronics are significantly positive, while its impact on manufactured consumer goods is significantly negative. Moreover, China's impact on automobiles also shifts from negative to positive.

[32] Sanitary products (81), furniture (82), travel goods (83), textiles (84), footwear (85), professional instruments (87), photographic equipment (88), and other manufactured articles (89).

[33] For sanitary products (81) and furniture (82), China's exports have positive coefficients in the second-stage estimates.

of exports of manufactured consumer goods are textiles for Bangladesh and Cambodia, respectively, while the same ratio is 2 and 10 percent for Japan and Singapore. Moreover, a variety of technology-intensive manufactured consumer goods tends to be produced in high-income Asian countries. 30 percent of exports of Japanese manufactured consumer goods in 2002 were professional instruments, while the comparable number for Vietnam was only 0.5 percent. Combining these different effects, we find that China's exports do not affect high-income Asian countries' exports of consumer goods, while significantly crowding out low-income Asian countries' exports to third markets.

In addition, substituting time-varying distance as our instrumental variable causes earlier anomalies to disappear. Previously we found that increases in China's exports of capital goods led to increases in other Asian countries' exports of capital goods to third markets; this would make sense only if components produced in China and components produced in other countries were used jointly in assembly operations in third countries. Now, in contrast, we find that China's exports have no significant effects on other countries' exports of components and other capital goods.

In sum, the estimates with time-varying instruments and country-pair effects tell us the following. First, China's exports crowd out Asian countries' exports of labor-intensive consumer goods, but not their exports of technology-intensive consumer goods. Second, China's exports of intermediates continue to be positively associated with other Asian countries' exports of intermediates. Third, China's exports do not significantly affect other Asian countries' exports of capital goods. Combining these findings for third markets with those for China's own demand (Table 4), we still find that China's growth is beneficial for the exports of capital-intensive and natural-resource-intensive Asian countries but not for labor-intensive low-income Asian countries.

9 Conclusions and Implications

How China's emergence is affecting the export competitiveness of the country's neighbors has important implications at the national, regional, and global levels. Most obviously, the impact of China's exports has implications for national development trajectories, in Asia and elsewhere. If the addition each year of another medium sized emerging market to the global economy drives down the world market prices of labor-intensive manufac-

tures, this will heighten the incentive for other countries to move up the technological ladder into the production of more technologically-intensive, less labor-intensive exports in order to better insulate themselves from Chinese competition. In order to do so, they will presumably want to invest even more in human capital. In contrast, countries that produce raw materials and capital goods utilized intensively in Chinese manufacturing may wish to specialize further in these areas.

At the regional level, China's emergence suggests that any regional free trade arrangement or effort to more closely coordinate monetary and financial policies will not be attractive if it does not involve what will eventually be the region's largest economy. This fact already finds reflection in policy, for example in the Chiang Mai initiative to provide swap lines and credits for financially-embattled economies, which is a project of ASEAN+3 (ASEAN plus China, Japan, and South Korea).

Globally, the impact of China's exports on the exports of other Asian countries has implications for whether we should expect a revaluation of the yuan to lead to a general revaluation of Asian currencies and to thereby help to redress the problem of global imbalances. One frequently heard argument is that if China revalues, moderating the competitive pressure felt by other Asian economies, those other Asian economies will be able to revalue as well, and the general realignment of Asian currencies against the U.S. dollar will help to narrow the U.S. current account deficit and relieve the competitive pressure felt by Europe without causing major disruptions to the world economy. But if China's exports are positively correlated with the exports of its Asian neighbors, insofar as the main impact of China's export growth is to stimulate that country's own demand for imports of raw materials, components, and capital equipment from elsewhere in the region, then a revaluation of the RMB which slows the growth of China's own exports may work to reduce the exports of the neighbors, depressing rather than boosting their own growth and creating pressure for depreciation rather than appreciation elsewhere in the region. Thus, the general revaluation of Asian currencies seen by some observers as a solution to the problem of global imbalances may not in fact follow from a slowing of Chinese growth due to a tightening of domestic credit or from a yuan revaluation.

In this paper we have analyzed the impact of China's growth on the exports of its Asian neighbors, distinguishing the increase in China's own demand for imports from the effects of its increased penetration of export markets and the tendency for the latter to crowd out the exports of its

Asian neighbors. We have also disaggregated among commodity types and adjusted for the endogeneity of Chinese exports.

We find different effects for exporters of capital and intermediate goods on the one hand and consumer goods on the other and hence for Asia's more and less-developed countries. There is a tendency for China's exports to third markets to crowd out the exports of other Asian countries. But this effect is felt mainly in markets for consumer goods and hence by less-developed Asian countries that export those products, not in markets for capital goods and by the more advanced Asian economies for which machinery and equipment comprise a significant fraction of total exports. This makes sense, in that it has been markets for generic consumer goods and not those for technologically sophisticated machinery and equipment that have been first to be penetrated by Chinese exporters. At the same time, there has been a strong tendency for a rapidly growing China to suck up imports from its Asian neighbors, offsetting the third-market effect to a greater or lesser extent. But this direct effect of Chinese imports is mainly felt in markets for capital goods and intermediates, where China's income elasticity of import demand is highest, and thus by relatively advanced Asian economies.

Hence, more and less developed Asian countries are being affected very differently by China's rise. Our benchmark results suggest that an increase in Chinese output, and thus in both China's appetite for imports and capacity to export, positively affects the exports of its high-income neighbors but negatively affects the exports of less-developed countries in the region.

These results are not reassuring for those concerned with the plight of Asia's poorer countries. Of course, trade is only one channel through which China is affecting its Asian neighbors. An example of another channel is foreign direct investment (FDI). The issues that arise in this context are analogous to those analyzed here. On the one hand, there is FDI diversion, or the tendency for China as an FDI magnet to appropriate foreign investment previously destined for other Asian countries. On the other hand, there are the benefits of Asian countries' own FDI in China, which presumably means a higher marginal rate of return on investment than would be available otherwise to domestic firms and households. As in our analysis, the overall impact depends on the relative magnitude the two effects, which can only be determined empirically. But some previous discussions of FDI diversion suggest, analogously to our results for trade, that Asia's less-developed countries that seek to compete with China on the basis of labor costs are particularly exposed to the danger of FDI diversion.

The past is also an imperfect guide to the future. Our results suggest that China's elasticity of demand for imports from its Asian neighbors has been shifting up over time. If this trend continues, it could be that the direct positive impact of China's demand for imports will soon dominate the third-market crowding-out effects of its exports for a growing number of Asian countries. The fact that China's trade balance has recently swung from surplus to deficit, evidently as a corollary of its continuing economic growth, is consistent with this more sanguine view. Be that as it may, we will have to wait for more data before we know whether this outcome in fact obtains.

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