Trading With Asia's Giants

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Abstract

The United States' large and sustained trade deficit with Asia raises concerns in the United States about its competitiveness in the region. The purpose of this paper is to examine the patterns of U.S. trade relationships with China and India, and the factors that are influencing their evolution. In contrast to the current public policy debate, the discussion largely addresses how these two economies compare as markets for U.S. exporters. This paper begins by noting that U.S. exports to both countries do appear low relative to the performance of Japan and the EU-15. We examine potential explanations for the weak exports from three different perspectives. First, we analyze the composition of U.S. exports to these economies, and consider how this mix of products compares to those which it appears to be competitive in exporting to the rest of the world. Second, we examine the role of multinational corporations in facilitating the trade flows between the U.S and these two economies. Finally, we employ the use of "gravity equations" to examine the bilateral trade patterns while controlling for a variety of country-specific characteristics, such as distance. In this context, we are also able to analyze the pattern of trade in services as well as the more traditional focus on goods trade.

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Strong economic gains in China and India have captured an extraordinary amount of global attention, and the potential spread of economic prosperity to the world's two largest countries is a truly momentous development. At the same time, however, the United States' large and sustained trade deficit with Asia raises concerns in the United States about its competitiveness in the region. In recent years most of the focus has been on the bilateral trade balance with China; however, a different but equally contentious set of issues – centering on business services – is emerging with respect to U.S. trade with India. The purpose of this paper is to examine the patterns of the U.S. trade relationships with China and India, and the factors that are influencing their evolution. In particular, the public policy discussion has focused on imports from the region, while largely ignoring the role of U.S. exports. Much of our discussion compares these two economies as markets for U.S. exporters.

We begin with a brief review of the trade flow patterns that motivate this study. The large bilateral imbalance in U.S.-China trade is well known. While the overall magnitude of U.S. goods trade with India is much smaller, that bilateral trade deficit is also substantial in percentage terms. Our review highlights two important aspects of these trade relationships. First, despite all the focus on fears of job loss associated with U.S. imports from China, those imports do not stand out as particularly large when compared with European and Japanese imports from China. Instead, what stands out is the comparatively low level of U.S. exports to both China and India. Second, U.S. trade data shows services trade to be even larger with China than it is with India, and the bilateral trade balance with both countries to be in balance or a slight surplus. These findings are surprising in light of all of the expressed fears about outsourcing of services jobs to India. Throughout the analysis, we explore U.S. trade with both India and China

by contrasting it with their trade with the other two major industrialized economies of Japan and the EU-15.[1]

The main body of the paper evaluates the trade relationship from three perspectives. First we look at the composition of U.S. exports to the two economies. Do the products the U.S exports to China and India differ from the products for which it appears to have a comparative advantage in world markets more generally? Such a finding could be interpreted as suggesting the existence of various import barriers. How does the composition of U.S. exports compare with those of Japan and the EU-15?

Second, we look at the role of multinational corporations because of the often-cited link between foreign direct investment and subsequent trade flows. Multinational firms are believed to focus on the creation of production and distribution networks that facilitate trade. Are American business firms as actively involved in India and China as implied by their operations in other economies? Do they serve as sales agents for their own imports into these countries?

Finally, we undertake a more structured analysis by estimating a set of simple "gravity equations." This enables us to examine trade with India and China in the context of bilateral trade patterns more generally and to control for a variety of country characteristics including the distance between trading partners. Perhaps the problem is simply that India and China are far away? If so, this would shift the puzzle from why U.S. exports are so small, to why its imports into the United States are so large. In this context, we examine patterns of services trade as well as the more traditional focus on goods trade.

Context

While it is often reasonable to consider the roles of China and India together in evaluating the growth of trade with Asia, it is also important to recognize their differences. Economically, China is a much larger country and has far greater

[1] The EU-15 refers to the fifteen members of the European Union prior to its May 2004 expansion to 25 countries. For comparative purposes, the EU-15 group corresponds more closely in income levels to the United States and Japan. The expanded EU includes a number of Eastern European states with significantly lower income levels and limited links to the global economy. The 15 are: Austria, Belgium, Denmark, Finland, France Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom.

interactions with the global economy. The acceleration of economic growth began much earlier in China, and over the past quarter century, average incomes have risen well above those of India. This gap has continued to widen in recent years, as GDP and trade have advanced more rapidly in China than in India. Figure 1 shows the growth of income per capita in the two countries. It makes clear the extent to which China has leaped ahead, with average income now nearly twice that of India. A summary of the sector composition of growth is provided in figure 2. China has achieved a faster growth of labor productivity in each of the three major sectors of agriculture, industry and services, but industry stands out as the largest source of difference. India matches China's growth only in the services-producing sector. At the same time, the two countries have experienced roughly equivalent gains from the reallocation of labor from low (agriculture) to high productivity sectors (industry and services). By international standards, both economies have been growing at extraordinary rates, but China's growth is broader and has been sustained for a much longer period.

Some basic statistics covering U.S. trade with China and India in 2005 are shown in table 1.[2] The unusual size of the trade deficit with China is very evident. However, despite the emphasis often placed on imports from China, the middle panel indicates that imports from China are a smaller share of GDP for the United States than in Japan, (2.2 versus 2.4 percent). Instead, the bilateral relationship seems unusual in the small magnitude of U.S. exports to China. U.S. exports to China comprise only 0.5 percent of GDP compared to 2.6 for Japan. In fact, Japan has had a consistent trade surplus with China. Compared with the U.S., the EU-15 also exports a larger share of its GDP to China, and combined with its lower share for imports, has a significantly smaller trade imbalance.

The precise size of the bilateral trade imbalance between the United States and China – and to a lesser extent, China's global trade balance – has been a subject of some dispute. Issues involving differences in the measurement of bilateral trade flows have been extensively explored in a series of prior papers.[3] Most of the confusion is caused by

[2] Our definition of China combines the trade data for the Mainland, Hong Kong, and Macao.

[3] The issues were clarified in a series of papers by Feenstra and others (1999), Fung and Lau (1996, 2003), Fung and others (2006), and Shindler and Beckett (2005). A recent paper by Wang

the transshipment of goods through Hong Kong. Not only do exporters often not know the true destination of such products, there is also a significant change in value due to the additional margins added by the Hong Kong traders. Both the United States and China alter the source of imports that pass through Hong Kong if they judge that greater value was added prior to arrival in Hong Kong. However, both report Hong Kong as the destination for much of their own exports. Fung and others (2006) obtain an estimate of the U.S. bilateral trade deficit with China of $172 billion in 2005 compared with official estimates of $202 billion published by the United States and $114 billion published by China. We avoid some of the problems that they identify by focusing on trade with the combination of China, Hong Kong, and Macao.

India represents a sharp contrast to China in the small size of its goods trade.[4] Although India's GDP is a third that of China, its global trade is only about 12 percent as large while its trade with the United States is less than 10 percent as large. Even more striking, Japan's trade with India is less than 5 percent of it's trade with China. Only in the case of the EU-15, does the relative size of the bilateral trade seem proportionate to the size of the two economies. For example, EU-15 exports to India are three times those of the United States. Similar to China, the United States has a large bilateral trade deficit with India, while both Japan and the EU-15 have small bilateral trade surpluses.

Surprisingly, China's global trade in services is substantially larger than India's, although the two countries' service trade ratios are roughly proportionate to their GDPs.[5] In spite of the discussion of the off-shoring of service jobs to India, the United States reports a larger volume of services trade with China than India, and a positive services trade balance with both countries. The EU-15 countries report services imports from both China and India that exceed those of the United States, but they too show a bilateral surplus. Japan's reported services trade with India, on the other hand, is quite trivial. India's estimate of $55 billion in services exports includes $42 billion for other services, excluding transportation and tourism. We would expect most of this trade to be with the

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and others (2007) uses a highly flexible algorithm to reconcile China's trade data with all of its major trading partners.

[4] A detailed comparison of the global trade performance of the two countries is available in Panagariya (2006).

[5] See Nikomborirak (2007) for a discussion of the service industries in the two countries.

high-income economies of the EU-15, Japan, and the United States. However, as shown in the middle of the table, these countries together report services imports from India totaling only $11 billion. It is difficult to discern the strong performance of India's services sector from these statistics.

There are, however, major concerns about the international comparability of statistics on services trade. The measurement of services trade is more difficult than that of goods because in many cases the services transactions cannot be tied to any physical movement across a national border. Instead, the transactions are defined in terms of the residence of the buyer and seller, but residence can be a vague and easily changed standard. An additional complication arises because the United States reports services trade in two categories -- affiliated and unaffiliated. Affiliate transactions refer to intra-firm trade between parent firms and their affiliates. The United States does not report the country pattern of affiliate trade for the detailed categories of computer and other business services because it believes that the multinational companies cannot accurately account for their detailed intra-firm trade by country.

In recent years, India has consistently reported a level of exports to the United States in the category of Business, Professional, and Technical (BPT) Services that is more than twenty times that recorded by the United States as an import— $8,700 million versus $402 million, for example, in 2003. The General Accountability Office sent a team to India and issued a report in 2005 that identified most of the discrepancies.[6] To begin with, the U.S estimates are too low: the Bureau of Economic Analysis reports country-specific data only for unaffiliated trade. Given the importance of affiliated trade in total BPT services, it would be reasonable to increase the U.S. estimate by a factor of 3 to 4. Also, the importation of computer software that is embedded in imported computers is classified as part of goods trade, rather than services. However, because India is not a major exporter of embedded software, the different treatment is probably not a major contributor to the discrepancy.

Issues with the Indian data account for most of the remaining discrepancy. The Indian balance of payments deviates from U.S. practice in two major respects. First, the

[6] They have authored two reports on the issue. See United States General Accountability Office (2004) and (2005).

earnings of Indian workers who reside in the United States are included in India's service exports, but excluded in the U. S. data if they intend to stay more than one year. That activity is believed to represent about 40 percent of India's total BPT exports. Second, India reports the internal sale of services to local affiliates of U.S. firms as part of its exports. That is estimated to be about 30 percent of the BPT total. Thus, the GAO concluded that, relative to U.S. standards, the level of service exports to the United States was overstated, by a factor of 2 to 3 in the Indian data.[7]

Measuring trade in services accurately is thought to be more challenging for the importing country because consumers tend to be considerably more diffuse than producers. Since there is no counterpart to customs reports on goods, the United States relies heavily on surveys of service-importing firms. In contrast to exporters, these are spread over a large number of industries and can be difficult to identify. From the Indian side, exporters are a more readily identified producer group. At the present time, however, India and the OECD countries appear to be reporting very different concepts of services trade.

Composition of Goods Exports

The weak performance of U.S. exports to China and India is a long-standing phenomenon. The United States has had a consistent trade deficit with both countries dating back to the mid-1980s. In this section, we compare the commodity composition of U.S. exports to both countries with the composition of U.S. exports to the world more generally. Perhaps the low level of U.S. exports to these countries reflects differences in the types of goods the U.S. exports to each relative to the types of goods it exports to the world as a whole. We also compare the composition of U.S. exports with those of the EU-15 and Japan as an indicator of the extent to which they are competitors in these markets.

Measures of the correlation of commodity composition of trade with China and India and the world as a whole are shown at the level of 237 3-digit SITC codes in the top of table 2. The simple rank correlation is reported on the left, and the correlations based

[7] Some of the issues for computer services are discussed from the Indian perspective in Reserve Bank of India (2005).

on shares of total trade are shown on the right. First, it is notable that the composition of U.S. exports to China seems very similar to the composition of its global exports, a rank correlation coefficient of 0.84. We obtain a matching result for the EU-15 countries, and the correlation is even more evident for Japan (a rank correlation coefficient of 0.92). We interpret this result as implying that the Chinese market is about as open to industrial country exports as world markets are more generally. The rank correlations are lower for India, but large differences do not emerge until the correlations are computed on the basis of shares of total exports. The large drop in the correlation for trade between the EU-15 and India compared with the EU-15's trade with the world results because 30 percent of their exports to India are accounted for by shipments of precious stones for polishing and finishing. The deletion of this single commodity category would raise the correlation from 0.26 to 0.60. This commodity group accounts for 5 percent of U.S. trade with India and zero for Japan.

Second, the table shows that the three high-income economies export very similar products to China, and therefore appear to be strong competitors in that market. The rank correlation between U.S. and EU-15 exports to China is 0.78, declining only modestly to 0.72 for the correlation of actual commodity shares. However, the correlations fall dramatically for shares of exports to India. Again, this is largely due to the dominant role of precious stones in EU exports. In other respects, export patterns accord with areas of specialization: the U.S. is strong in aircraft, computing and telecommunications equipment; Japan has a prominent role in motor vehicles and various machinery categories; and EU-15 exports other than gem stones are concentrated in aircraft and telecommunications. However, outside of these dominant areas, there is very little overlap in what these economies export to India.

Overall, there is little that we find unusual about the commodity composition of U.S. trade with India and China. It is similar to U.S. trade with the world more generally. It is also evident that the industrial economies are strongly competitive with one another in both markets; but the competition is more extensive in China.

We conclude that the low level of U.S. exports to both China and India cannot be attributed to restrictions that distort the commodity pattern of trade.

Finally, statistics on the commodity composition of trade can also be used to contrast the export performance of China and India. Panagariya (2006) argues that the composition of China's exports has rapidly shifted toward an emphasis on labor-intensive manufactures, while the composition of India's exports has remained more haphazard. He also points out that, at the 2-digit level of commodity trade flows, there is very little overlap between the exports of China and India. We obtain much the same result using the more detailed 3-digit classification. The rank correlation between their global exports is only 0.59 in 2005, and there is no correlation between the commodity share distributions. The correlations of the two countries' global imports are also quite low: the rank correlation is 0.77, but the correlation of 3-digit commodity shares falls to 0.42. Currently China and India are not close competitors in either export or import markets, and given the large differences in the size of their trade sectors, they occupy quite different positions in the trading system.

The Role of Multinational Corporations

The foreign direct investment (FDI) of multinational companies (MNCs) in emerging markets is believed to be important because it provides a beachhead from which to promote bilateral trade. From this perspective, it is notable that U.S. investments in both China and India are very small. Although the U.S. imports a large volume of goods from China, U.S. firms invested over the period of 2000-06 an average of only $5 billion per year, split equally between Hong Kong and Mainland China, or only about 3.5 percent of U.S. global FDI over the period. Investments in India were even smaller, averaging $0.75 billion, or 0.5 percent of the global total. While U.S. retailers, such as Wal-Mart and Mattel, have large imports from China, they do not deal with American multinationals in China. Instead, a large portion of their purchases are from foreign invested enterprises (FIEs) that originate from other countries in Asia, or from Chinese contract manufacturers. Similarly, the information and communication technology (ICT) trade with India appears to not pass through U.S. affiliates.

A summary of the activities of U.S. affiliates in China and India is shown in table 3. The data are drawn from the benchmark surveys of U.S. multinational corporations that are conducted at 5-year intervals. The top panel reports the results for China, and, as

with the trade data, it combines the information for the mainland and Hong Kong. First, although affiliate sales started from a very low level, they have grown at a rapid pace,[8] Total affiliate sales expanded at a 14 percent annual rate between 1989 and 2004, and the growth has been concentrated among affiliates on the mainland. Second, affiliate sales are focused on the domestic market, which accounts for 60 percent of total sales in 2004. Approximately 30 percent of sales are directed to other countries – largely in Asia -- and only 12 percent are sales back to the United States. Furthermore, as shown at the bottom of the table, only 10 percent of U.S. exports to China pass through the affiliates, and only 5 percent of imports originate with affiliates. Clearly U.S. multinationals operate in China with minimal trading links to their U.S. operations. They are not directly utilizing China's low labor costs for exports back to the U.S. market.

Comparable data for India is reported in the bottom panel of table 3. The contrast in scale of the operations with that reported for China is similar to the prior analysis of trade flows. U.S. affiliate sales in India in 2004 were only 10 percent of the total for China. The emphasis on the local market is even greater – 75 percent of total sales – primarily because the trivial amount of sales to third countries. Despite all of the discussion of the off-shoring of IT services, little of it appears to involve affiliates of U.S. multinationals.

For comparison purposes, we have also compiled some data on Japanese affiliate operations in China that are presented in table 4. Japanese affiliate sales are considerably smaller than those of the United States, but they are expanding even more rapidly. They are less focused on the local market (about 45 percent of sales), and export a larger percent of sales back to Japan. However, like U.S. firms, the affiliates are not used as vehicles to promote exports from Japan -- sales to affiliates are less than 10 percent of exports to China. In its published material, the Japanese Ministry of Economy, Trade and Industry does not identify India, presumably because the affiliate activities are very small, commensurate with the scale of its trade.

An alternative set of data from the OECD on the outstanding stock of FDI in 2005 provides additional information on the relative involvement of the three large industrial economies in China and India (OECD, 2007). The United States is the largest investor of

[8] Exports have also grown rapidly in recent years, 15 percent annually in the 2000-06 period.

the three with investments of $55 billion in China and $8.5 billion in India; but as noted above, they represent very small shares of its global investments. The EU-15 is of similar importance with $51 billion in China and $6.5 billion in India. Japan has a substantial investment base in China, $31 billion; but is very small in India, $2 billion.

Branstetter and Foley (2007) conclude that affiliate activity in China is very much in line with U.S. operations in other countries and that it is motivated by both the size of the domestic market and favorable tax treatment. We find that same emphasis on the domestic market in India with only a weak linkage to trade.

It seems clear that U.S firms operating in China and India do not serve as vehicles for exports, although a loose linkage seems to be a common feature of U.S. affiliates throughout the world. U.S global exports to affiliates of multinationals represented only 5.6 percent of affiliate sales in 2004. The 4.5 percent reported for affiliates in China and the 4 percent in India are not appreciably different. In comparison, Japanese exports to their affiliates in 2002-03 were 6 percent of sales at the global level and 20 percent in China.

The Role of Distance

The simplest explanation for a low level of exports between the United States and the Asian economies is that they are far away. However, distance does not provide an obvious explanation for the asymmetry of the trade relationship, with small exports but large imports, that is evident for China and India. In this section, we use econometrics to explore its role more formally.

The use of gravity equations to explain the pattern of bilateral trade flows dates back to the work of Jan Tinbergen in the early 1960s. In their simplest form, the volume of trade between any two countries is proportionate to their economic size and various measures of "trade resistance." Measures of trade resistance have included distance between the two trade partners, the presence of a common language or membership in preferential trade associations.[9] We use the gravity model framework to examine the

[9] A useful review is provided by Deardorff (1998). Helpful recent discussions of linkages between the theoretical formulations and the empirical analyses are those of Anderson and van Wincoop (2004) and Helpman, Melitz, and Rubenstein (2007).

extent to which such a model can account for the differential importance of China trade for the United States, Japan and the EU-15.

The empirical analysis is based on a very simple formulation in which economic size is measured by the combination of a country's population and its income per capita. In addition, the trade (distinguishing between imports and exports) between a country and its trading partners is estimated separately for the United States, Japan, and the EU-15. The base regression is:

$$(1)\ \ln T_{ij} = \alpha + \beta_1 \ln POP_j + \beta_2 \ln Y_j + \beta_3 \ln D_j + \beta_4 \ln X_{i,j}.$$

Where T_{ij} = trade (imports or exports) from country i to country j,

POP_j = population of country j,

Y_j = GDP per capita of country j,

D_{ij} = distance between country i and country j, and

X_{ij} = other measures of "trade resistance".

Normally, the relationship would also include the population and income per capita of both country pairs, but in our analysis the relationship is estimated separately for each of the three base economies (the United States, Japan, and the EU-15).

Goods Trade: The annual trade data are taken from the Direction of Trade Statistics of the International Monetary Fund and cover the period 1980-2005. GDP and population are from the World Development Indicators of the World Bank. The trade data are scaled by the nominal dollar GDP of each of the base economies and the GDP per capita of the trading partners is measured in 2000 U.S. dollars. The measures of distance and the other bilateral pairing variables used to proxy "trade resistance" – such as language, contiguity and colonial link – were obtained from the French Institute for Research on the International Economy (CEPII).[10]

The basic results are reported in table 5 and cover 162 countries over 26 years. All of the equations are estimated with a fixed-effects formulation to allow for shifts in

[10] The distance measure is the weighted distance measure of CEPII, which reflects the bilateral distance between the major cities of each country. The definition of a common language that we use states that a language is shared if it is spoken by at least 9 percent of the population in both countries. A country shares a language with the EU15 if this is true for any of the 15 countries.

the constant term over each of the 26 years.[11] The number of observations varies slightly across the individual regressions because the few countries in each sample for which no trade is recorded have been dropped. Also, while the individual countries of the EU-15 are included in the regressions for the United States and Japan, regressions for the EU-15 exclude intra-group trade. The regressions are very consistent with similar estimates in the literature: the elasticity of trade with respect to the two measures of economic size is very close to unity and there is a strong role for distance.

Of greatest relevance in the current context, the distance coefficients are very large and significant in all of the regressions. Unexpectedly, there is evidence of an asymmetric effect on U.S. trade: the distance coefficient for U.S. exports is markedly greater than that for imports. A similar, though smaller, asymmetry also exists for the EU-15; but the asymmetry is reversed for Japan where the coefficient on distance is largest in the import equation. The coefficient on distance is interpreted by some researchers as a measure of global integration. From that perspective, importers to the United States appear to have been considerably more successful than U.S. exporters in overcoming trade barriers associated with distance from the U.S. market. Furthermore, the reversal of the relationship for Japan implies that Japan has been more successful in overcoming barriers to its exports than others have been in overcoming barriers to their exports to Japan. It is also notable that the effects of distance on exports from and especially imports to Japan are significantly larger in magnitude than for either the U.S. or the EU-15.

The role of distance has a major effect on conclusions about the magnitude of U.S. trade with Asia. This is particularly true for trade with China, which is far away from the United States (11,000 kilometers), but close to Japan (2,000 kilometers). An elasticity of distance near unity implies that the U.S. export share in GDP would be very similar to that for Japan if the two countries' distance from China were equalized. Thus, distance can fully account for the differences in the importance of exports to China. However, if the distance were equalized, the hypothetical level of U.S. imports from

[11] The use of fixed-effects estimation had no significant influence on the estimated coefficients, but it does reduce the evident autocorrelation of the error term. These year dummies adjust for a variety of factors that may be changing over time, such as overall openness and degree of exchange rate overvaluation.

China would also increase by a proportionate amount.[12] India is even further away from the United States (13,500 kilometers).[13]

In testing the robustness of the results, we examined a wide range of alternative formulations.[14] For example, we included categorical variables for each of the three major economies in the trade relationships of the others. Canada and Mexico were also included directly in the U.S. equations. While those variables were all significant, they had no substantial effect on the size of the other coefficients in the regressions, such as distance. Furthermore, we found a more general pattern in which all of the East Asian economies had positive residuals, implying a larger volume of trade than indicated by the simple distance variable.

The results with the categorical variable for East Asia are shown in a second set of regressions in table 7. The East Asia coefficient is large and positive in the U.S. regressions, raising the predictions for both exports and imports; but surprisingly, there is no significant change in the coefficients for the other variables including distance. Also, the magnitude of the regional effect seems to be similar for both imports and exports. There is some decline, however, in the magnitude of the asymmetry of the coefficient on distance between the export and import equations. A similar result is evident for the EU-15, although the coefficient on the Asia variable is only half as large. The regression results for Japan are quite different, however, because the coefficient on the East Asia region is extremely large, twice the magnitude shown for the United States; and the coefficients on distance decline dramatically. It is evident that an important regional trading pattern has emerged within East Asia that is not well-represented in a simple focus on distance. This formulation did not work, however, when we tried to expand the definition of the categorical variable to include South Asia.

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[12] The distance elasticity for imports from China is less than for exports, but the level of imports is much larger.

[13] The distance from Japan to India is 6,000 kilometers, and for the EU-15 the average distance are 6,800 kilometers to India and 8,300 to China.

[14] There are also significant econometric issues that we have not addressed (See Helpman and others (2007) for a discussion). In our data set we do not have a significant problem with zero bilateral trade entries, which have to be excluded in a logarithmic estimation. In addition, the distinction between intensive and extensive trade should be important for us only on the import side, and we do not yet have an effective estimation method.

The actual and predicted results for U.S. exports and imports in 2005, based on the regressions with the East Asia variable, are shown in figure 3. Because exports to Canada and Mexico are so dominant, they are excluded from the figure to focus on exports to the other countries. The figure highlights two important results of the analysis. First, within a gravity equation framework, both exports and imports from China are larger than expected. In 2005, the export relationship, shown in the top panel, produces a 50 percent underestimate of exports to China that is markedly less than the large over-estimate of trade with countries like the United Kingdom and Japan. In contrast, imports from China, shown in the lower panel, exceed the predicted values by about 70 percent. U.S. trade with India is so small that it is difficult to identify in the figure. However, the predicted and actual values are very similar: the error in 2005 for exports is zero and the predicted level of imports is above by 5 percent.

Second, the figure highlights that, while exports to China may be a small share of U.S. GDP, they are relatively substantial compared to U.S. exports to other countries. The basic problem is that, except for Canada and Mexico, the United States has a low level of exports to all countries. Within that framework, exports to China are comparable to those to Germany and the United Kingdom. In other words, while U.S. exports to China are small in comparison to those of other countries, they are not small within the context of U.S. exports to other countries.

Services Trade. Traditionally, gravity equations have been applied to bilateral trade in goods. In recent years, however, the OECD has begun to publish data on the bilateral services trade flows of its members. We obtained data covering the seven years from 1999-2005 for exports and imports of total services for the EU-15 and Japan.[15] The data for the United States were obtained from the Bureau of Economic Analysis and cover the years 1992-2006. We applied the same gravity model, outlined in equation (1), to the services trade of the United States, Japan, and the EU-15 (excluding intra-EU trade). Those regressions are reported in table 6.

[15] The data on trade in services by partner country is available at: http://stats.oecd.org/wbos/default.aspx. At present, disaggregated partner country data below the level of total services is not available.

The results are very similar to those reported for goods trade in that distance, size, and income per capita again have large and highly significant elasticities, and the regressions fit the data very well. The coefficients on distance, however, are generally smaller and show more variability. In part, that is due to the smaller sample sizes; but we also estimated a set of parallel regressions for goods trade that was restricted to the same countries and years for which we had data on services trade. For the United States and Japan, the distance coefficients for services trade are smaller than for goods trade, but they were larger for the EU. It is notable that there is again a special positive effect for the East Asian economies of equal magnitude in both the export and import regressions. The United States' services trade with East Asia is substantially greater than would be predicted by the standard gravity equation.

As with goods, we are surprised by the magnitude of the distance variable as it can have little to do with freight costs. In fact, we re-estimated the U.S. regressions with travel and transportation excluded: it had no significant effect on the parameters. Figure 4 shows the distribution of U.S. trade in services by partner country. The largest errors for both exports and imports are an under-prediction of services trade with the United Kingdom and an over-prediction for Japan. The high level of trade with the United Kingdom is related to financial services because both countries are important global finance centers. Trade with China and India is very close to predicted.

Effects of the U.S. Trade Deficit

One interesting issue that is highlighted in figure 3 is that U.S. exports to China and India are not small if the comparison is limited to U.S. trade alone. It is small only in comparison with other countries' trade. This issue can be developed more clearly with the ranking of U.S. trade with partner countries shown in table 7. While China is the second largest source of U.S. imports behind Canada, it is also the fourth largest export destination. In the comparison with Japan and the EU-15, the striking feature is the small share of total exports as a share of GDP. As shown in the lower part of the table, total U.S. exports are only 7.3 percent of GDP in 2005, compared to 13.1 and 11.4 for Japan and the EU-15 respectively. In contrast, the United States actually imports a slightly larger share of its GDP than either Japan or the EU-15. The table shows the extent to

which the comparison of the relative importance of exports is distorted by the large overall trade deficit of the United States. Given that the overall trade deficit of the United States is equal to 90 percent of total exports, the comparison of U.S. trade with most partner countries is bound to appear unfavorable.

Several studies have attempted to project a process of future adjustment of the trade balance that focuses on changes in exchange rates. An important common element of all these studies is that the adjustment of trade flows will appear largely on the export side. Empirically, exports and imports are found to have similar price elasticities near unity (Gagnon, 2003). Thus, an exchange rate depreciation will increase the volume of exports and decrease imports by similar percentage amounts. However, measured in nominal dollars, imports will remain largely unchanged since the reduced volume will be offset by an equivalent increase in the dollar cost. On the other hand, the nominal value of exports, with no dollar price change, would rise in line with the change in volumes.[16] As shown in table 7, the U.S. trade deficit is roughly equal to total exports; and if we projected a future adjustment that restored a trade balance, the export share would roughly double as a share of GDP. If we also adopted the reasonable assumption that the adjustment would spread in proportionate terms across all trading partners, the Chinese and Indian markets would be much more important to the United States.

Conclusion

The large U.S. trade imbalance with Asia is a frequent topic of concern in the U.S. media and policy discussion. There is a perception that the imbalance is somehow the result of unfair trade practices. The trade issues take on added importance with respect to U.S. economic relations with China and India who are emerging as global centers for manufacturing and business services respectively. In this paper, we have argued that it is the low level of U.S. exports to the region, not the magnitude of imports that appears puzzling. Thus, we have examined various possible explanations for the low exports, focusing on trade with the two economic giants, China and India, with whom we

[16] In reality, the adjustment process would be more complex, in part because of the need to take account of possible limits of the pass through of exchange rate changes into export and import prices. See Cline (2005) and Mann (1999) for more detailed discussions.

have particularly large trade deficits. U.S. imports from China, for example, scaled by U.S. GDP, are similar to those of Japan and EU-15 imports from China as a share of their own GDPs. In contrast, the U.S. exports a much smaller share of its GDP to China than either the EU-15 or -- especially -- Japan. Indeed, U.S. exports to China are still less than a quarter of its imports, while Japan exports more to China than it imports. Even though U.S. exports to China have been growing rapidly since 2002, this growth is from such a small base that it would take a long time to have much effect on the bilateral balance.

Our main findings are as follows. First, the poor performance of U.S. exports of goods does not reflect an unusual export composition. Like Japan and the EU-15, the distribution of commodities that the U.S. exports to China is quite similar to the basket it exports to the rest of the world. Furthermore, with the exception of agricultural goods and raw materials, the mix of commodities that the U.S. exports to China is very similar to the exports from Japan and Europe. Thus, the U.S. is clearly competing with these countries, especially in the Chinese markets for capital goods and electronics. We find no evidence that the composition of U.S. trade with China is distorted. The situation is less clear-cut for India where the composition of U.S. exports is less correlated with its global trade and with the exports of the EU-15 and Japan.

Second, small U.S. exports to China and India may be due in part to the relatively small presence of U.S. multinationals. Operations of these affiliates to date have largely focused on serving the domestic markets of both China and India, with relatively little trading links to their operations in the U.S. In any case, U.S. FDI to both countries is now growing rapidly, though from a very small base.

Third, our more formal econometric analysis using gravity equations highlights both expected and unexpected dimensions of the importance of distance. Like the large prior literature that uses the gravity framework to explain trade flows, we find distance always to be a very important and significant determinant. Since China and India are far away from the U.S., one would expect that controlling for distance would help explain the relatively small U.S. exports to China, with the large imports emerging as an outlier instead. Quite surprisingly however, we find that U.S. exports to East Asia and imports from the region are both unexpectedly large. Even after adjustment for the East Asia

region, U.S. exports to and imports from China are both larger than expected. Trade with India is about what would be predicted, however.

Finally, our most important finding is that the low level of U.S. exports is a global phenomenon and not one limited to trade with the Asian economies. At present, the United States has a trade deficit with nearly every country of the world, and the imbalance with the Asian economies stands out primarily because they account for a large proportion of total trade. At seven percent of GDP, U.S. exports are only about half the level of its imports and only half the share of GDP reported for Japan and the EU-15. Most of the concerns about trade with the Asian economies would be resolved by an adjustment of the U.S. global trade balance.

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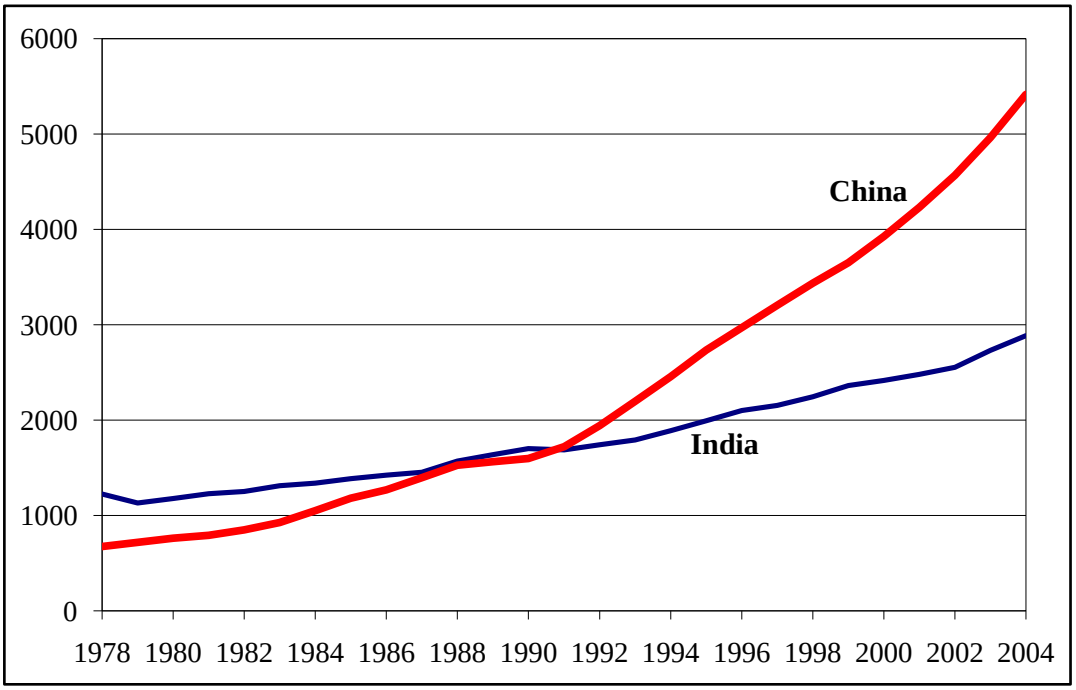
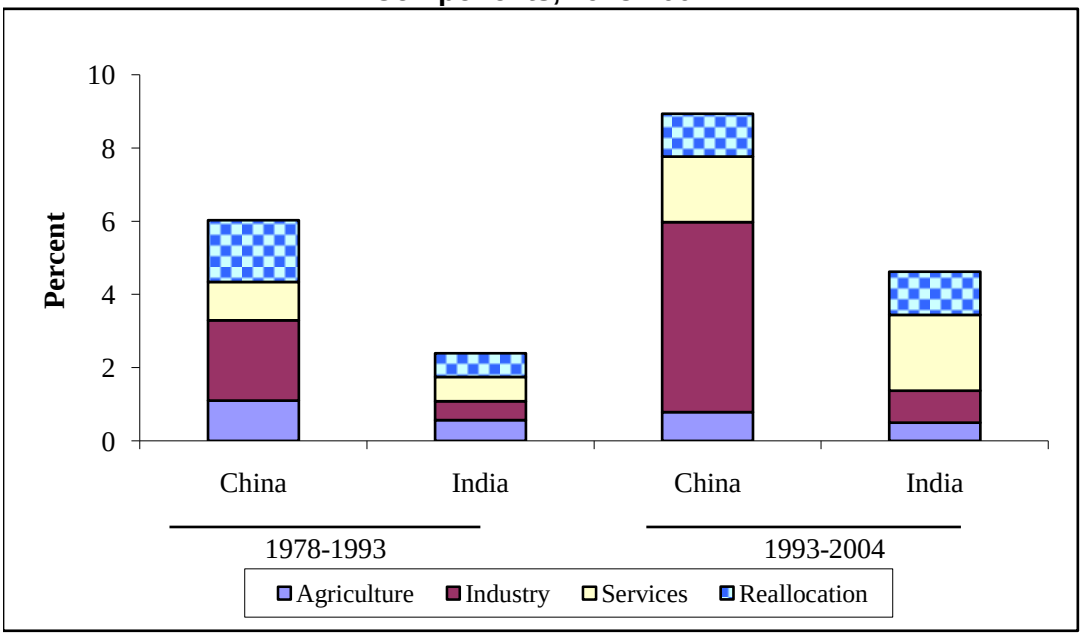
Figure 1. GDP per Capita, China and India
Constant 2000 International (PPP) Dollars



Source. World Bank. 2006. **World Development Indicators**.This purchasing power parity measure of GDP standardizes for differences in the prices of common products across countries and over time.

Figure 2. Growth in Output per Worker: Sector and Reallocation Components, 1978-2004



Source: Bosworth and Collins (2006).

Table 1. Trade With China and India, Major Industrial Economies, 2005

billions of U.S. dollars

		United States		Japan		EU-15	
GDP		12,417		4,534		12,765	
		Goods	Services	Goods	Services	Goods	Services
Global Trade							
	Exports	904.3	367.8	594.9	110.3	1,459.2	514.0
	Imports	1,732.5	281.6	515.2	134.3	1,581.7	454.8
	Balance	-828.3	86.2	79.7	-24.0	-122.5	59.2
Bilateral Trade With:							
	Exports	58.2	13.4	116.0	10.5	87.8	23.7
China	Imports	269.1	12.1	110.0	14.2	205.0	17.7
	Balance	-211.0	1.4	6.0	-3.7	-117.3	6.0
	Exports	8.0	5.2	3.5	0.8	25.6	6.5
India	Imports	19.9	5.0	3.2	0.3	23.3	5.8
	Balance	-11.9	0.1	0.3	0.4	2.3	0.7
	Percent of GDP						
	Exports	0.47	0.11	2.56	0.23	0.69	0.19
China	Imports	2.17	0.10	2.43	0.31	1.61	0.14
	Balance	-1.70	0.01	0.13	-0.08	-0.92	0.05
	Exports	0.06	0.04	0.08	0.02	0.20	0.05
India	Imports	0.16	0.04	0.07	0.01	0.18	0.05
	Balance	-0.10	0.00	0.01	0.01	0.02	0.01

Global Trade

		Goods	Services	Total	GDP
	Exports	1,054.5	146.8	1,201.3	
China	Imports	930.8	119.4	1,050.1	2,406.6
	Balance	123.8	27.4	151.2	
	Exports	102.2	55.8	158.0	
India	Imports	134.7	48.0	182.7	785.5
	Balance	-32.5	7.8	-24.7	

Source: IMF Directions of Trade Statistics for goods trade, and OECD for services trade.

Table 2. Correlations of Bilateral Commodity Trade, 2005

	Rank Correlation of Commodity Trade		Correlation of Trade Shares	
	China	India	China	India
World/Country				
United States	0.84	0.77	0.78	0.69
Japan	0.92	0.88	0.67	0.51
EU-15	0.84	0.78	0.72	0.26
Competitors				
U.S./Japan	0.74	0.71	0.61	0.27
U.S./EU-15	0.78	0.82	0.72	0.52
Japan/EU-15	0.78	0.81	0.72	0.15

Source: United Nations Comtrade database. Correlations based on three-digit SITC commodity classification, with a total of 237 codes. Commodity share is the value for each code divided by the relevant bilateral total.

Table 3. U.S. Affiliate Activities in China and India, 1989-2004

millions of US Dollars

	1989	1994	1999	2004
China:				
U.S. Multinational Affiliate Sales				
Total Sales	16,664	32,954	67,635	123,531
Sales to the U.S.	3,554	4,638	10,405	14,297
Local Sales	7,438	19,289	42,565	73,602
Sales to other foreign countries	5,672	9,027	14,665	35,632
U.S. Exports of Goods to Affiliates	2,261	5,719	7,533	5,402
U.S. Imports of Goods from Affiliates	3,071	4,021	8,500	9,719
Total US Trade with China*				
Exports	12,111	20,732	25,670	50,530
Imports	23,139	51,504	97,499	220,308
India:				
U.S. Multinational Affiliate Sales				
Total Sales	323	983	4,554	13,100
Sales to the U.S.	(D)	28	138	1,582
Local Sales	(D)	934	4,327	9,914
Sales to other foreign countries	13	21	89	1,604
U.S. Exports of Goods to Affiliates	23	33	331	508
U.S. Imports of Goods from Affiliates	(D)	28	77	373
Total US Trade with India*				
Exports	2,463	2,296	3,666	6,095
Imports	3,551	5,663	9,598	16,437

Sources: BEA Surveys of U.S. Direct Investment Abroad, and IMF Directions of Trade Database

Data for China includes Hong Kong. Sales are those of majority-owned companies

Notes: "(D)" indicates that the data has been suppressed to avoid disclosure of data of individual companies

Table 4. Japanese Affiliate Activity in China

million of U.S. dollars

	2002	2003
Japan Multinational Affiliate Sales		
Total Sales	27,515	43,524
Sales to Japan	9,506	13,062
Local Sales	9,665	18,497
Sales to other foreign countries	8,349	11,772
Japan Exports of Goods to Affiliates	6,270	8,305
Japan Imports of Goods from Affiliates	3,685	5,077
Total Japan Trade with China*		
Exports	65,390	87,398
Imports	63,211	76,907

Source: Japanese Ministry of Economy, Trade, and Industry, and IMF Directions of Trade Database

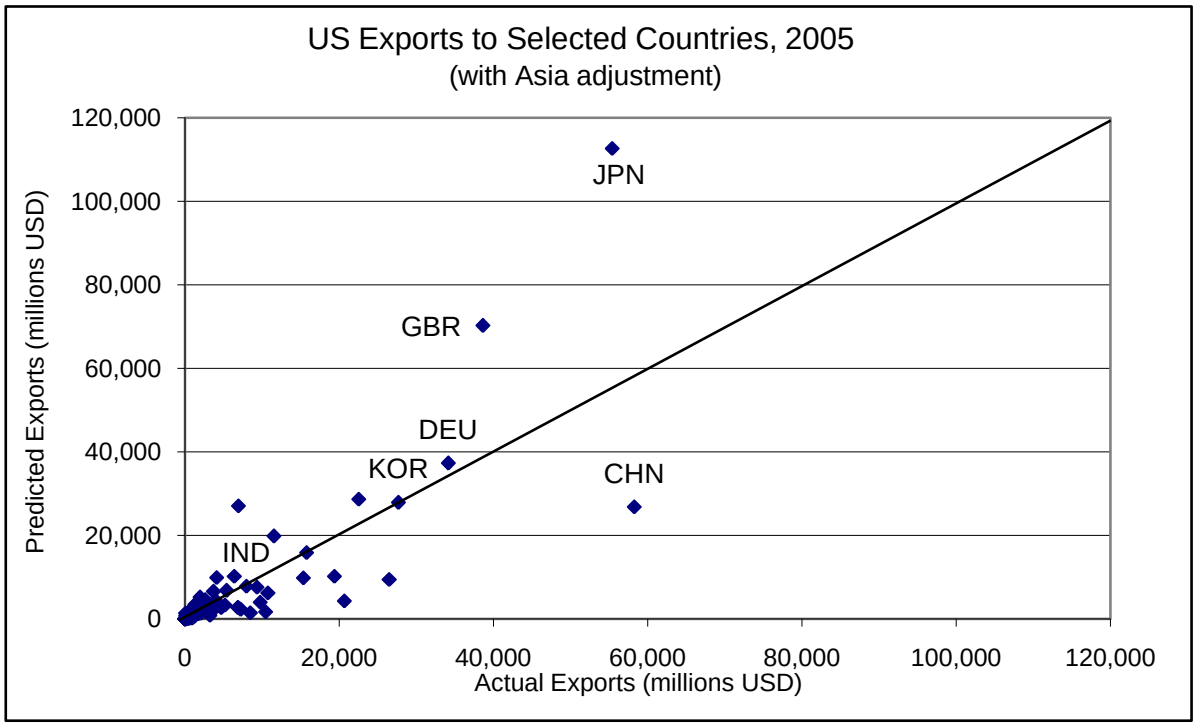
data include mainland China and Hong Kong

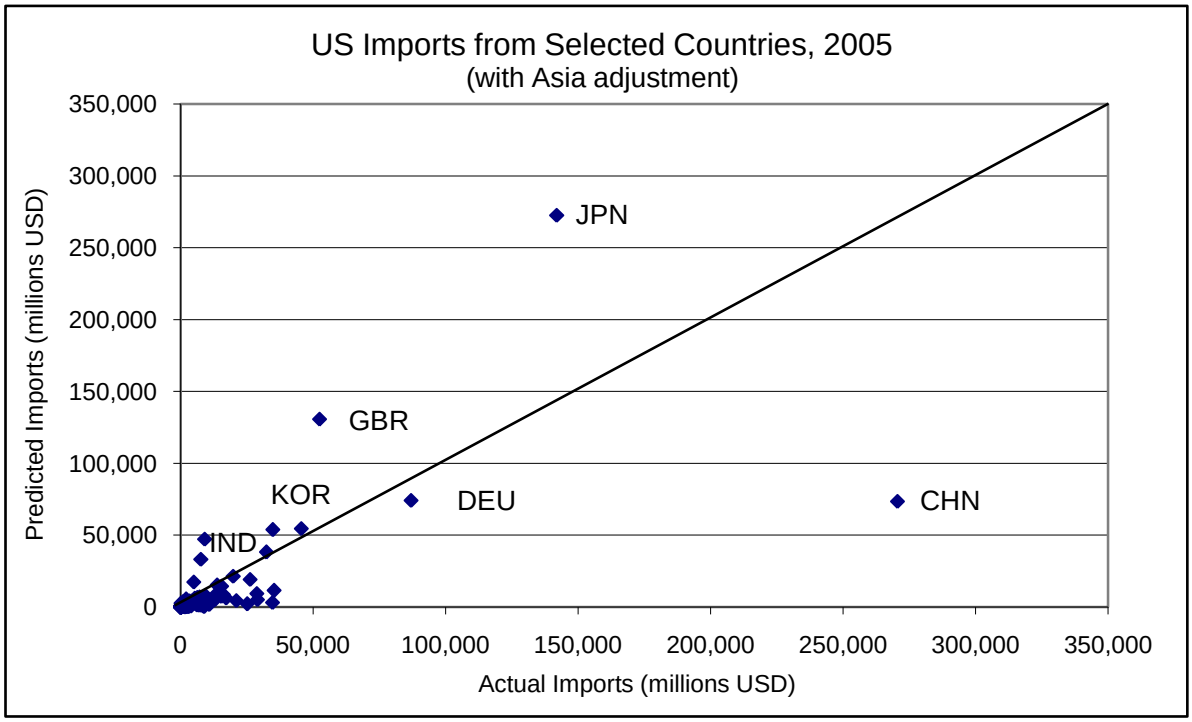
Table 5. Gravity Equations for Global Trade: United States, Japan, and EU-15

	United States				Japan				European Union (15)			
	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP
	(1)	(1)	(2)	(2)	(1)	(1)	(2)	(2)	(1)	(1)	(2)	(2)
Weighted Distance	-1.02	-0.60	-1.16	-0.71	-1.11	-1.55	-0.61	-0.65	-1.06	-0.74	-1.15	-0.79
	(-29.2)	(-11.3)	(-31.9)	(-13.0)	(-26.0)	(-24.0)	(-10.7)	(-7.7)	(-48.7)	(-26.3)	(-43.9)	(-23.3)
Log Population	0.90	1.05	0.90	1.05	0.82	0.93	0.86	1.00	0.79	0.90	0.79	0.90
	(106.0)	(81.8)	(108.2)	(82.5)	(88.6)	(64.0)	(90.8)	(68.0)	(124.4)	(110.6)	(125.1)	(110.7)
Log GDP per Capita	1.06	1.15	1.05	1.14	0.98	1.13	1.01	1.18	0.87	0.90	0.87	0.90
	(98.2)	(70.6)	(98.7)	(70.2)	(83.0)	(63.2)	(85.9)	(67.2)	(97.6)	(78.3)	(97.2)	(77.8)
Common Language	0.70	0.71	0.67	0.69					0.26	0.26	0.30	0.29
	(20.1)	(13.6)	(19.6)	(13.2)					(8.0)	(6.4)	(9.2)	(6.9)
Colony									0.32	0.24	0.38	0.28
									(7.0)	(4.2)	(8.2)	(4.7)
East Asia Region			0.56	0.51			0.89	1.61			0.25	0.15
			(11.8)	(7.0)			(13.1)	(15.8)			(6.1)	(2.8)
Constant	-37.17	-44.12	-35.97	-43.06	-33.90	-33.46	-39.39	-43.36	-32.98	-37.83	-32.28	-37.41
	(-100.1)	(-78.9)	(-95.1)	(-74.7)	(-72.8)	(-47.1)	(-63.7)	(-46.6)	(-139.6)	(-124.5)	(-123.4)	(-110.8)
adj_R2	0.858	0.760	0.863	0.763	0.812	0.714	0.820	0.733	0.886	0.841	0.887	0.841
Observations	3577	3532	3577	3532	3626	3534	3626	3534	3367	3367	3367	3367

Source: Estimated by authors as described in text. All of the regressions are estimated within a fixed effects model allowing for shifts over years.

Figure 3. Actual and Predicted U.S. Goods Trade, 2005





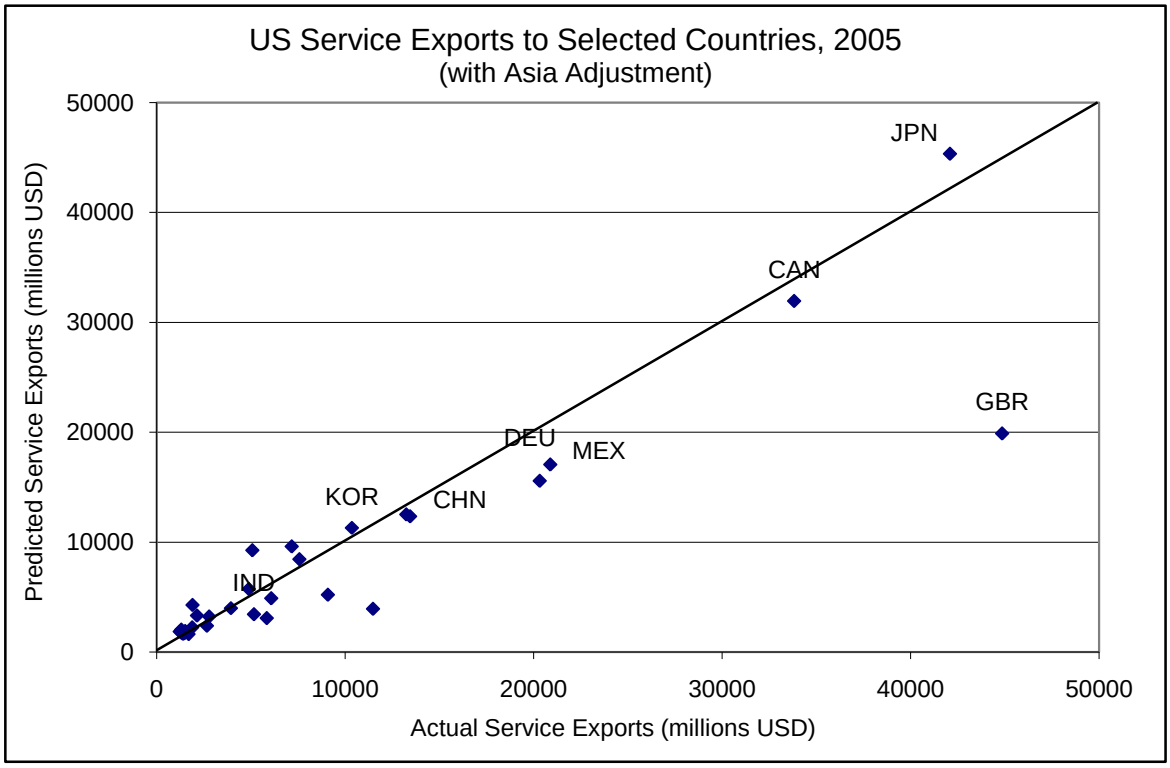
Source: Computed from equations of table 5. Values for Canada and Mexico are excluded from the Charts.

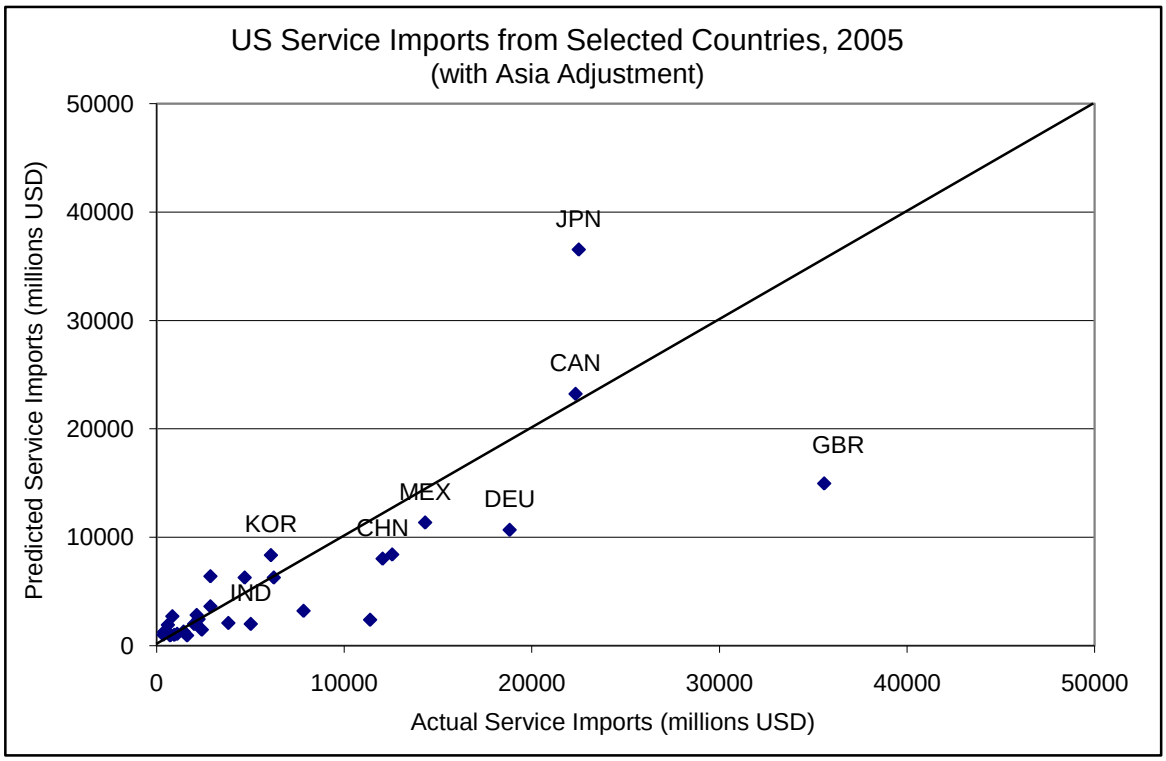
Table 6. Gravity Equations for Services Trade: United States, Japan, and EU-15, 1999-2005

	United States		Japan		European Union (15)	
	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP	Log Exports/GDP	Log Imports/GDP
	(2)	(2)	(2)	(2)	(2)	(2)
Weighted Distance	-0.56	-0.57	-0.25	-0.32	-1.08	-0.87
	(-14.7)	(-10.0)	(-1.9)	(-3.3)	(-20.9)	(-13.5)
Log Population	0.71	0.78	0.84	0.79	0.74	0.81
	(40.1)	(29.2)	(15.5)	(20.2)	(40.5)	(35.2)
Log GDP per Capita	0.90	1.01	1.11	1.19	0.77	0.78
	(41.6)	(31.2)	(18.0)	(26.0)	(31.1)	(25.0)
Common Language	0.30	0.40			0.13	-0.23
	(8.0)	(7.1)			(1.8)	(-2.6)
Colony					0.29	0.23
					(3.8)	(2.4)
East Asia Region	0.49	0.57	1.68	1.71	0.73	0.92
	(11.2)	(8.7)	(9.5)	(13.2)	(8.4)	(8.4)
Constant	-37.37	-40.11	-45.36	-44.34	-31.19	-34.02
	(-55.6)	(-39.7)	(-22.5)	(-30.1)	(-62.4)	(-54.0)
adj_R^2	0.879	0.794	0.681	0.805	0.882	0.850
Observations	420	420	187	196	265	265

Source: Estimated by authors as described in text. All of the regressions are estimated within a fixed effects model allowing for shifts over years. The data are from the OECD and cover 31 trading partners for the United States, 28 for Japan and 38 for the EU-15.

Figure 4. Actual and Predicted U.S. Services Trade, 2005





Source: Authors' calculationas in text.

Table 7. United States Top Trading Partners, 2005

Billions U.S. dollars

Country	Exports	Percent	Rank	Country	Imports	Percent
EU-15	182	2284.5		EU-15	308	1547.2
Canada	211	2656.7	1	Canada	292	1468.9
Mexico	120	1508.6	2	China	270	1360.8
China	58	732.1	3	Mexico	172	867.8
Japan	55	696.3	4	Japan	142	714.2
United Kingdom	39	485.4	5	Germany	87	437.4
Germany	34	429.1	6	United Kingdom	52	263.5
Korea	28	347.7	7	Korea	46	229.0
Netherlands	26	332.9	8	Venezuela, Rep. B	35	177.6
France	23	283.2	9	France	35	175.0
Singapore	21	259.4	10	Malaysia	35	174.5
India	8	0.9	20, 17	India	20	1.1
Total	904	Percent		Total	1,733	Percent
Trade Deficit	-11,917					

Country	Exports	Percent of GDP	Country	Imports	Percent of GDP
US	904	7.3	US	1,733	14.0
Japan	595	13.1	Japan	515	11.4
EU15	1,459	11.4	EU15	1,582	12.4
incl. intraEU	3,688	28.9	incl. intraEU	3,810	29.9

Source" IMF Direction of Trade Statistics and authors' calculations.

Appendix Table A1. Top Ten Exports to China of the US, Japan, and EU-15 by SITC Commodity Code, 2005

Code	Description	US-China Rank	Japan-China Rank	EU15-China Rank	US-World Rank
776	Thermionic, microcircuits, transistors, valves, etc	1	1	2	2
792	Aircraft and associated equipment, and parts thereof, nes	2	194	1	1
222	Seeds and oleaginous fruit, whole or broken, for 'soft' fixed oil	3	205	219	31
874	Measuring, checking, analysis, controlling instruments, nes, parts	4	14	8	9
759	Parts, nes of and accessories for machines of headings 751 or 752	5	9	22	11
764	Telecommunication equipment, nes; parts and accessories, nes	6	7	3	7
288	Non-ferrous base metal waste and scrap, nes	7	44	16	83
583	Polymerization and copolymerization products	8	11	11	12
752	Automatic data processing machines and units thereof	9	38	36	8
263	Cotton	10	195	169	58
931	Special transactions, commodity not classified according to class	13	2	6	5
728	Other machinery, equipment, for specialized industries; parts nes	18	3	4	18
674	Universals, plates, and sheets, of iron or steel	74	4	23	57
778	Electrical machinery and apparatus, nes	17	5	19	17
772	Electrical apparatus for making and breaking electrical circuits	16	6	5	16
784	Motor vehicle parts and accessories, nes	34	8	17	3
511	Hydrocarbons, nes, and derivatives	39	10	112	33
781	Passenger motor vehicles (excluding buses)	25	19	7	4
667	Pearl, precious and semi-precious stones, unworked or worked	14	145	9	26
749	Non-electric parts and accessories of machinery, nes	24	15	10	22
541	Medicinal and pharmaceutical products	47	80	20	6
714	Engines and motors, non-electric; parts, nes; group 714, item 71888	26	70	15	10
Source: United Nations Comtrade database			3	4	

Note: Figures are the rank of exports out of a possible 237 three-digit commodity codes.

Appendix Table A2. Top Ten Exports to India of the US, Japan, and EU-15 by SITC Commodity Code, 2005

Code	Description	US-India Rank	Japan-India Rank	EU15-India Rank	US-World Rank
792	Aircraft and associated equipment, and parts thereof, nes	1	153	3	1
931	Special transactions, commodity not classified according to class	2	11	5	5
667	Pearl, precious and semi-precious stones, unworked or worked	3	113	1	26
764	Telecommunication equipment, nes; parts and accessories, nes	4	16	2	7
752	Automatic data processing machines and units thereof	5	74	35	8
874	Measuring, checking, analysis, controlling instruments, nes, parts	6	7	8	9
282	Waste and scrap metal of iron or steel	7	125	9	67
897	Gold, silver ware, jewelry and articles of precious materials, nes	8	119	87	53
598	Miscellaneous chemical products, nes	9	24	19	19
057	Fruit and nuts, fresh, dried	10	197	188	34
784	Motor vehicle parts and accessories, nes	58	1	33	3
724	Textile and leather machinery, and parts thereof, nes	42	2	7	122
736	Metalworking machine-tools, parts and accessories thereof, nes	33	3	13	43
674	Universals, plates, and sheets, of iron or steel	18	4	10	57
749	Non-electric parts and accessories of machinery, nes	29	5	6	22
713	Internal combustion piston engines, and parts thereof, nes	43	6	28	14
728	Other machinery, equipment, for specialized industries; parts nes	22	8	4	18
772	Electrical apparatus for making and breaking electrical circuits	23	9	12	16
583	Polymerization and copolymerization products	19	10	22	12
776	Thermionic, microcircuits, transistors, valves, etc	21	17	46	2
781	Passenger motor vehicles (excluding buses)	169	22	58	4
541	Medicinal and pharmaceutical products	32	50	17	6
714	Engines and motors, non-electric; parts, nes; group 714, item 71888	13	81	23	10
Source: United Nations Comtrade database			1	6	

Note: The 'Rank' figures are the rank of exports to India out of a possible 237 three-digit commodity codes.