Enjoying the Fruits of Their Labor: Redirecting Exports to Asian Consumers

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There has been an explosion in the amount of parts and components traded within East Asian production networks. The People's Republic of China (PRC) has emerged as the final assembly point for the goods produced. These goods then flow primarily outside of the region. When the global financial crisis (GFC) occurred, the decrease in Western demand led to a synchronized decline in Asian exports. If more final goods could flow to Asian consumers, it would provide insurance against another slowdown in the rest of the world. This paper uses a gravity model to investigate if emerging Asia is importing fewer consumption goods than predicted. The results indicate that since the GFC, the PRC and the Association of Southeast Asian Nations (ASEAN) have imported more final goods than expected. Nevertheless, their consumption imports per capita are orders of magnitude lower than those of developed economies. This highlights the need for further growth in emerging Asia.

Keywords: consumption, gravity models, production networks
JEL codes: F13, F14

I. Introduction

The value of intermediate goods traded among East Asian economies increased 40 times between 1980 and 2012. In 2012, more than $450 billion in intermediate goods was traded within the region.[1] This explosion in intraregional trade reflects the development of intricate production networks. Firms have exploited a comparative advantage by slicing up production processes and allocating the production modules to different locations based on variances in factor endowments across the fragmented production blocks.

[1]These data come from the CEPII-CHELEM database. East Asia includes the PRC; Indonesia; Japan; the Republic of Korea; Malaysia; Singapore; Taipei,China; and Thailand. Of the $450 billion intermediate goods traded in 2012, 49% came from electronic components; 20% from engines, vehicle components, and rubber items such as tires; 11% from miscellaneous hardware; 6% from yarns and fabrics; and the rest from paints, paper, tubes, plastics, metallic structures, wood articles, and fertilizers.

This slicing up of the value chain began in earnest after the Japanese yen appreciated 60% following the Plaza Accord in September 1985. Japanese multinational corporations (MNCs) lost their price competitiveness and responded by shifting labor-intensive activities to the Republic of Korea and Taipei,China. However, in the late 1980s, both wages and exchange rates in these economies skyrocketed, and the locational advantage of assembling labor-intensive goods in the newly industrialized economies declined. In response, Japanese firms transferred production to member economies of the Association of Southeast Asian Nations (ASEAN). Surplus labor in ASEAN member economies held wages down and exchange rates in these economies were pegged at competitive levels relative to the United States (US) dollar. After the People's Republic of China (PRC) joined the World Trade Organization (WTO) in 2001, there was a surge in foreign direct investment (FDI) and parts and components exports from East Asian economies to the PRC. The PRC's WTO accession gave foreign investors the confidence that the PRC would sustain an FDI-friendly environment. The PRC quickly became the final assembly point of intricate production and distribution networks. It imported hundreds of billions of dollars of parts and components from East Asia and exported the final assembled products throughout the world.

The surge in final goods exports from the PRC has been breathtaking. Its exports of computers, consumer electronics goods, and telecommunications equipment increased more than 70 times between 1993 and 2012 to reach $500 billion. In 1993, only 2.5% of the world's exports of final electronics goods came from the PRC, while in 2012, 43% of the world's exports of these goods came from the PRC. The next leading exporting economy in 2012 exported only 5% of the world's final electronics goods.[2]

Athukorala (2014) documented that, while the intermediate goods trade in East Asia has exploded, demand for final goods produced within production networks comes primarily from outside the region. He found that the PRC did not provide a cushion against export contraction during the global financial crisis (GFC). He also observed that the decrease in demand from the rest of the world during the GFC caused a synchronized trade contraction in East Asia.

Figure 1a shows the share of final electronics goods going to East Asia and the rest of the world.[3] More than 80% of these goods flow outside the region, while East Asia's share has not increased since the 1990s. Figure 1b shows that the share going to North America has increased since the GFC to about 36%, while the share going to Europe has fallen to 23%. The share going to all other economies has increased steadily since the GFC and now exceeds the share going to Europe.

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[2]These data come from the CEPII-CHELEM database.
[3]East Asia in the figure includes the PRC; Indonesia; Japan; the Republic of Korea; Malaysia; Singapore; Taipei,China; and Thailand.

Figure 1a. **Share of the PRC's Final Electronics Goods Exports to East Asia and the Rest of the World**
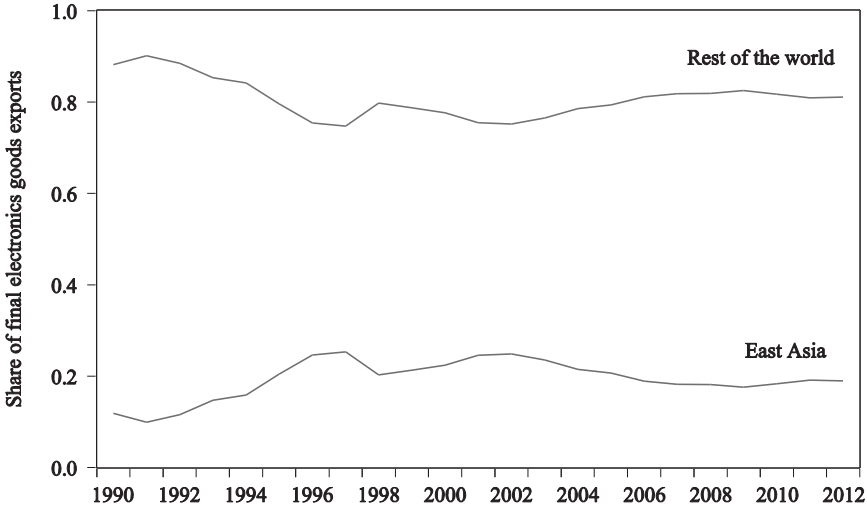
PRC = People's Republic of China.
Notes: Final electronics goods comprise the following categories: consumer electronics, telecommunications equipment, and computer equipment. East Asia includes the PRC; Indonesia; Japan; the Republic of Korea; Malaysia; Singapore; Taipei,China; and Thailand.
Source: CEPII-CHELEM database.

Figure 1b. **Share of the PRC's Final Electronics Goods Exports to Regions Outside of East Asia**
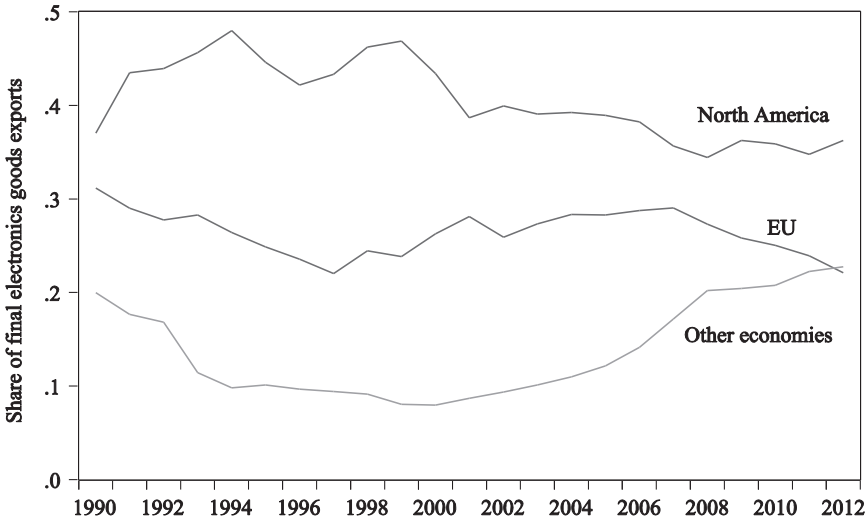

PRC = People's Republic of China.
Notes: Final electronics goods comprise the following categories: consumer electronics, telecommunications equipment, and computer equipment. East Asia includes the PRC; Indonesia; Japan; the Republic of Korea; Malaysia; Singapore; Taipei,China; and Thailand. The European Union (EU) includes 28 member countries.
Source: CEPII-CHELEM database.

Figure 2a. **Japanese Automobile Parts and Components Exports**
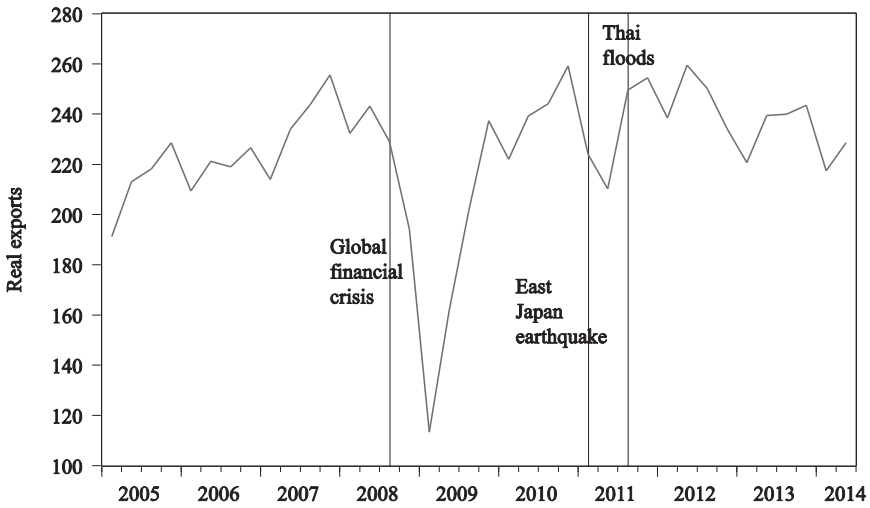
Source: CEIC database.

Figure 2b. **Japanese Electronics Parts and Components Exports**
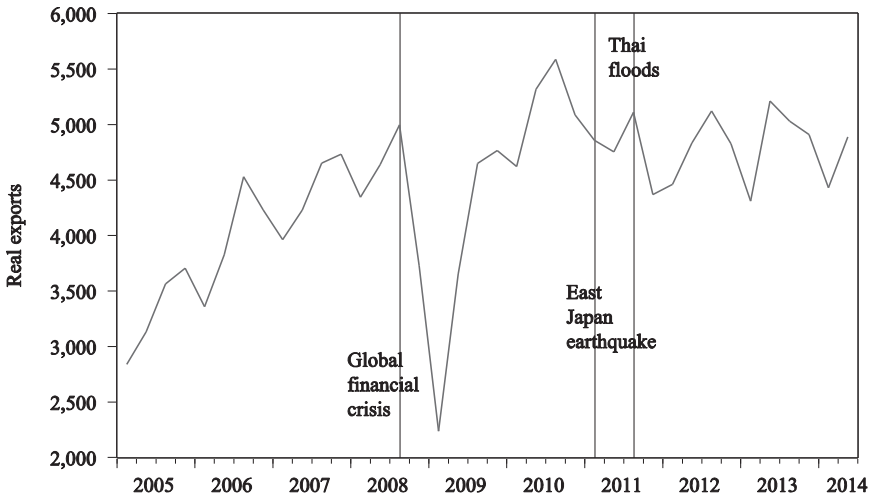
Source: CEIC database.

Exports within Asian production networks are more sensitive to demand shocks caused by events such as the GFC than to supply shocks caused by events such as the Great East Japan Earthquake or the flooding in Thailand that began in 2011. Figures 2a and 2b present data on the volume of Japanese exports of automobile parts and semiconductors. These are two of the main categories of Japanese parts and components exports within regional production networks. Following the GFC, exports of both categories fell by more than 70% and took almost 2 years to return

to precrisis levels. By contrast, the drops in exports of both categories following the Great East Japan Earthquake and flooding in Thailand were an order of magnitude smaller and the recoveries rapid. Ando and Kimura (2012) have presented careful evidence indicating that the GFC had a prolonged effect on Japanese exports, while the earthquake did not.

One lesson of the GFC is that it would be desirable for regional production networks to decouple from final demand in the West. The Ministry of Economy, Trade and Industry (METI) (2009) reported that there are 930 million people in Asia in the middle class or above. Thus, there is huge potential for demand by Asian consumers to function as a second engine of growth. Channeling more final goods to the region would also allow Asian workers to enjoy more of the fruits of their own labor.

This paper investigates whether the economies involved in East Asian production networks are importing fewer final goods than one would expect. The key economies involved in these regional supply chains are the PRC; Indonesia; Japan; the Republic of Korea; Malaysia; Singapore; Taipei,China; and Thailand. To examine whether they are importing fewer consumption goods than expected, the gravity model is employed. This model is a workhorse for estimating bilateral trade flows. Traditional gravity models, as developed by Tinbergen (1962), posit that bilateral trade between two economies is directly proportional to gross domestic product (GDP) in the two economies and inversely proportional to the distance between them. As Leamer and Levinsohn (1995); and Baltagi, Egger, and Pfaffermayr (2014) discussed, gravity models yield some of the clearest and most robust findings not only in international economics but in all of economics. This model is thus used to predict consumption goods imports by Asian economies.

The results indicate that actual consumption imports into the PRC and ASEAN have increased relative to their predicted values and, in 2012, were more than predicted by the gravity model. Thus, emerging Asia is redirecting final goods to the region.

The evidence reported below also indicates that more progress is necessary. This paper considers how growth and development in the region can continue.

The next section presents the data and methodology. Section III presents the results. Section IV highlights the importance of investing in human capital to promote growth. Section V concludes.

II. Data and Methodology

The gravity model is a workhorse for estimating bilateral trade flows. As developed by Tinbergen (1962), gravity models posit that bilateral trade between two economies is directly proportional to GDP in the two economies and inversely proportional to the distance between them. In addition to GDP and distance, these

models typically include other factors affecting bilateral trade costs such as whether trading partners share a common language. The model takes the form

$$Ex_{ijt} = \beta_0 + \beta_1 Y_{it} + \beta_2 Y_{jt} + \beta_3 DIST_{ij} + \beta_4 LANG_{ij} + \beta_5 RER_{ijt} + \partial_i + \omega_j + \pi_t + \varepsilon_{ijt}$$

(1)

where Ex_{ijt} represents real exports from economy i to economy j; t represents time; Y represents real GDP; DIST represents the geodesic distance between the two economies; LANG is a dummy variable equaling 1 if the economies share a common language and 0 otherwise; RER is the bilateral real exchange rate between the two economies; and ∂_i, ω_j, and π_t are economy i, economy j, and time fixed effects, respectively.[4]

Data on consumption exports are obtained from the CEPII-CHELEM database. These include the following goods: beverages, carpets, cars, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.[5]

Gaulier, Lemoine, and Ünal (2011) noted that automobile imports into the PRC largely reflect purchases by rich Chinese consumers. Many of these are luxury cars imported from Germany. In one specification, these predominantly high-end imports are excluded.

Data on real GDP and real exchange rates are obtained from the CEPII-CHELEM database. The real exchange rate is the Consumer Price Index (CPI)-deflated bilateral real exchange rate between the exporting and importing economies measured in levels.

Data on distance and common language are obtained from www.cepii.fr. Distance is measured in kilometers and represents the geodesic distance between economic centers. Common language is a dummy variable equaling 1 if two economies share a common language and 0 otherwise.

The gravity model is estimated as a panel using annual data for 31 economies over the 1988–2012 sample period. The economies are Australia; Austria; Brazil; Canada; the PRC; Denmark; Finland; France; Germany; India; Indonesia; Ireland; Italy; Japan; Malaysia; Mexico; the Netherlands; Norway; the Philippines; Poland; Saudi Arabia; Singapore; the Republic of Korea; Spain; Sweden; Switzerland; Taipei,China; Thailand; Turkey; the United Kingdom; and the US.

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[4] Anderson, Vesselovsky, and Yotov (2013) have shown that exchange rates can exert real effects in the context of a gravity model when there are incomplete pass-through or scale effects.

[5] The category optics is not included in consumption imports because in the case of the PRC, many optical imports are inputs into the production process rather than final consumption goods. These inputs include unworked lens blanks of plastic, unworked lens blanks of glass, fiber optic cable for live transmission of images, and photolithography equipment for the manufacture of semiconductors.

Table 1. **Descriptive Statistics**

Variable	(1) Minimum Value	(2) Maximum Value	(3) Mean	(4) Standard Deviation
Consumer goods excluding cars ($ million)	0	91,887	714	2,626
Consumer goods including cars ($ million)	0	93,389	1,004	3,678
(Log of) Real GDP	10.61	16.47	13.14	1.18
(Log of) Distance	5.75	9.84	8.59	0.93
(Log of) Bilateral real exchange rate	−1.76	1.76	0	0.62
Common language	0	1.00	0.10	0.30

GDP = gross domestic product.
Source: Author's calculations.

Equation (1) has often been estimated as a log-linear model using panel least squares methods. Santos Silva and Tenreyro (2006) showed that this approach can lead to biased estimates when there is heteroskedasticity in the data-generating process. They reported simulation results indicating that Poisson pseudo-maximum likelihood (PPML) estimators perform better both in terms of bias and efficiency in several cases. PPML techniques are thus used to estimate equation (1).

Anderson and van Wincoop (2003) have argued that exports should depend on outward and inward multilateral resistance terms. These terms capture the fact that exports and imports between two economies depend not only on trade costs between the two, but also on changing trade costs between third economies. For instance, exports from economy i to economy j can be affected if economy i enters into a preferential trade agreement with a third economy k.

Models based on Anderson and van Wincoop's (2003) approach can be estimated by the equation

$$\ln\text{Ex}_{ijt} = \beta_0 + \beta_1 \ln\text{DIST}_{ij} + \beta_2 \text{LANG}_{ij} + \beta_3 \text{RER}_{ijt} + \partial_i + \omega_j + \pi_t + \varepsilon_{ijt} \qquad (2)$$

where the variables are as defined above. Here, the distance and language variables capture trade costs for exports between economies i and j, and the exporter and importer fixed effects variables capture the multilateral resistance terms. Time-varying fixed effects can also be included. Equation (2) is estimated as a sensitivity check for the results from equation (1).

Table 1 presents descriptive statistics for the variables. Since the data cover 31 economies over a 25-year period, there is a lot of variation in the data. The first row presents basic statistics for consumption exports excluding cars and the second for consumption exports including cars. The minimum value is zero. These zero values indicate that in some years, one economy in the sample did not export consumption goods to another. These zero values occur in less than 0.4% of the observations. It is not surprising that some of the economies do not trade consumption goods with each other in some years, especially for economies that are small and located far

apart. This should not affect the findings since Santos Silva and Tenreyro (2006) reported that the PPML technique used here is robust to the presence of zero values of the dependent variable.

The first row of Table 1 also indicates that the maximum value for consumption exports excluding automobiles exceeds $90 billion. For consumption exports excluding automobiles, there are eight observations where the values exceed $60 billion. These are for the PRC's consumption exports to the US in 2005–2012. Similarly, for consumption exports including automobiles, the eight largest observations are for the PRC's exports to the US in 2005–2008, and these all exceed $60 billion.

Rows 3 through 6 report descriptive statistics for (the logs of) GDP, distance, and the real exchange rate, and for the common language dummy variable. The means and standard deviations indicate that the values are spread over a wide range. The large degree of variation in the independent variables should help make the parameter estimates more precise. For the real exchange rate, the distribution is symmetric and centered around zero. This occurs because the log of the real exchange rate for exports from economy A to economy B equals minus the log of the real exchange rate for exports from economy B and economy A, and because both sets of exchange rates are included. For a common language, the results indicate that 10% of the economy pairs in the sample share a common language.

III. Results

Table 2 presents gravity estimates. Columns (1), (3), and (5) present results using consumer goods excluding cars; columns (2), (4), and (6) present results including cars. Columns (1) and (2) present results including importer and exporter GDP; columns (3) through (6) present results excluding the GDP variables. In columns (3) and (4), time-varying exporter fixed effects and importer fixed effects are included; in columns (5) and (6), exporter and importer fixed effects are included.

The coefficients on exporter and importer real GDP are large and statistically significant. They are larger in column (2), where the dependent variable includes cars, than in column (1), where it excludes cars. This indicates that higher incomes tend to be associated with more car imports.

The coefficients on distance and common language are the expected signs and statistically significant in all cases. The results in every specification indicate that distance is an important deterrent of trade and that sharing a common language is an important facilitator of trade. The coefficient on the real exchange rate is negative in four cases and positive in two. Overall, the gravity models perform well.

The discussion that follows focuses on the estimations in columns (1) and (2) that include exporter and importer GDPs. The relation between the size of real GDP and the amount of consumption imports is something that will be discussed

Table 2. **PPML Gravity Estimates, 1988–2012**

	(1)	(2)	(3)	(4)	(5)	(6)
Exporter GDP	0.71***	0.87***				
	(0.05)	(0.04)				
Importer GDP	0.69***	0.84***				
	(0.05)	(0.03)				
Distance	−0.75***	−0.80***	−0.88***	−0.76***	−0.75***	−0.81***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Common language	0.09***	0.08***	0.27***	0.27***	0.10***	0.09***
	(0.03)	(0.03)	(0.00)	(0.00)	(0.03)	(0.03)
Bilateral real exchange rate	−0.10*	−0.25***	−0.04***	−0.10***	0.16***	0.04***
	(0.06)	(0.06)	(0.00)	(0.00)	(0.06)	(0.07)
Constant	−5.68***	−9.98***	15.0***	15.0***	17.5***	18.3***
	(1.16)	(0.90)	(0.00)	(0.00)	(0.11)	(0.12)
Dependent variable	Consumer goods excluding cars	Consumer goods	Consumer goods excluding cars	Consumer goods	Consumer goods excluding cars	Consumer goods
Fixed effects specification	Exporter, importer, time	Exporter, importer, time	Time-varying exporter, importer	Time-varying exporter, importer	Exporter, importer, time	Exporter, importer, time
No. of observations	23,249	23,249	23,249	23,249	23,249	23,249
Sample period	1988–2012	1988–2012	1988–2012	1988–2012	1988–2012	1988–2012

GDP = gross domestic product, PPML = Poisson pseudo-maximum likelihood.
*** = significant at 1%, ** = significant at 5%, and * = significant at 10% level.
Notes: The table contains PPML estimates of gravity models. Bilateral exports from 31 major exporters to each of the other 30 economies in 1988–2012 are included. Huber-White standard errors are in parentheses.
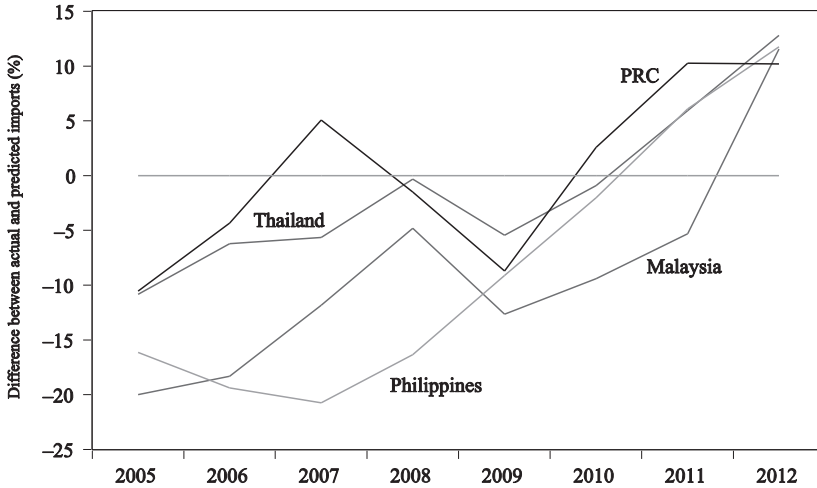Source: Author's calculations.

in the next section. The results in columns (3) through (6) reveal similar patterns to those discussed below; that is, consumption imports in emerging Asia are increasing relative to predicted values.

Figures 3a and 3b present the percent difference between actual and predicted imports for the PRC and the three emerging ASEAN economies that are most involved in regional production networks: Malaysia, the Philippines, and Thailand. Figure 3a presents results for consumption imports excluding cars, and Figure 3b for consumption imports including cars. Both figures indicate that actual consumption imports have risen relative to predicted consumption imports between 2005 and 2012. For the ASEAN economies in 2012, consumption imports excluding cars were 12%–13% greater than predicted and consumption imports including cars were 12%–15% greater. For the PRC in 2012, consumption imports excluding cars were 10% greater than predicted and consumption imports including cars were 20% greater. For all four economies, actual imports have been growing relative to predicted imports since the GFC.

Figures 4a and 4b present the percent difference between actual and predicted imports for ASEAN; the PRC; Japan; the Republic of Korea; and Taipei,China.

Figure 3a. **Difference between Actual Consumption Imports (excluding Cars) and the Values Predicted by a Gravity Model**
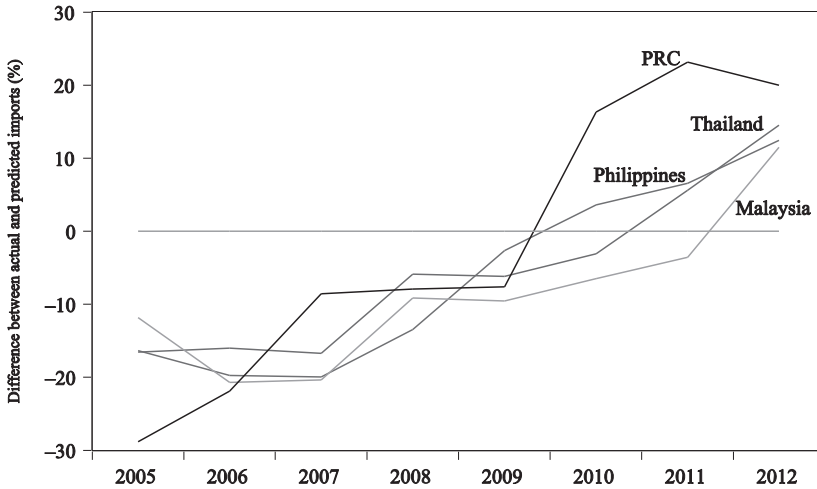
PRC = People's Republic of China.
Note: Consumption goods comprise the following categories: beverages, carpets, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.
Source: CEPII-CHELEM database and calculations by the author.

Figure 3b. **Difference between Actual Consumption Imports and the Values Predicted by a Gravity Model**
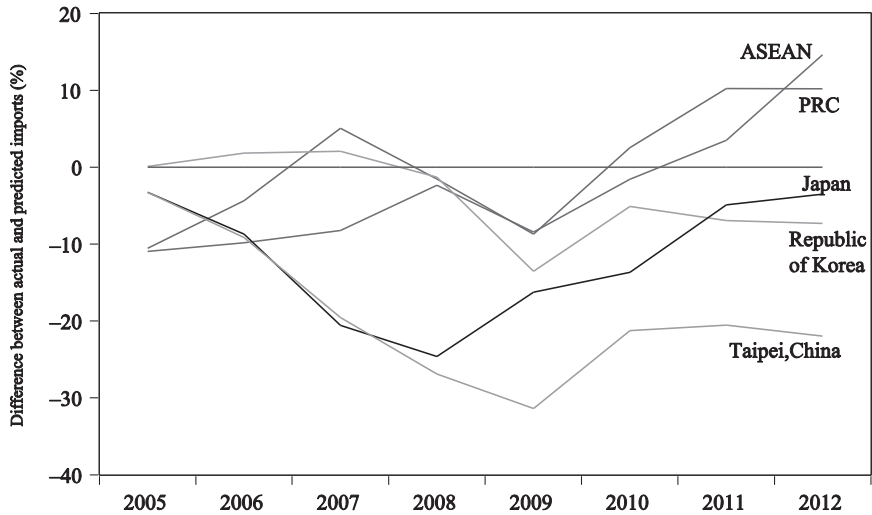

PRC = People's Republic of China.
Note: Consumption goods comprise the following categories: beverages, cars, carpets, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.
Source: CEPII-CHELEM database and calculations by the author.

Figure 4a. **Difference between Actual Consumption Imports (Excluding Cars) and the Values Predicted by a Gravity Model**

ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China.
Notes: ASEAN refers to Indonesia, Malaysia, the Philippines, and Thailand. Consumption goods comprise the following categories: beverages, carpets, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.
Source: CEPII-CHELEM database and calculations by the author.

Figure 4a presents results excluding car imports and Figure 4b including car imports. Imports into Japan and the Republic of Korea are close to their predicted values; imports into the PRC and ASEAN are well above their predicted values. For Taipei,China, on the other hand, consumption imports in both figures are far below their predicted values in every year. In Figure 4a, they are 18% below their predicted value in 2012 and in Figure 4b, they are 22% below in the same year.

The important implication of the results presented here is that emerging Asian economies involved in regional production networks are rebalancing. More and more final goods are flowing to consumers in these economies.

On the other hand, more progress is necessary. Figure 5 shows consumption imports per capita in 2012: $2,026 for Germany; $1,755 for France; $198 for ASEAN; and $36 for the PRC.

IV. Discussion

Figure 5 indicates that emerging Asia's consumption imports are orders of magnitude smaller than consumption imports in advanced economies. Table 2 shows that there is a strong relationship between an economy's consumption imports and

Figure 4b. **Difference between Actual Consumption Imports and the Values Predicted by a Gravity Model**

ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China.
Notes: ASEAN refers to Indonesia, Malaysia, the Philippines, and Thailand. Consumption goods comprise the following categories: beverages, carpets, cars, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.
Source: CEPII-CHELEM database and calculations by the author.

its level of real GDP. Thorbecke (2011) reported statistically significant income elasticities exceeding unity for consumption imports into Malaysia, the Philippines, the PRC, and Thailand in the context of the Bickerdike–Robinson–Metzler imperfect substitutes model. These findings imply that the populations of ASEAN and the PRC will be able to consume more if their economies continue to grow and develop. This section considers a few steps toward achieving this goal. Since innovation is crucial for growth, especially as economies develop, and since investing in education can promote innovation, the discussion below highlights human capital formation. In this regard, Rozelle (2010) emphasized that nurturing highly productive workers in poorer rural areas is essential for the PRC's development.

Figures 4a and 4b indicate that in 2012, the PRC and ASEAN imported much more than predicted and Taipei,China imported much less. One reason for the divergent results is presented in Figure 6, which shows that the real effective exchange rate (REER) has appreciated 34% in ASEAN and 38% in the PRC since 2005, while the REER of Taipei,China depreciated 21% during this time. The exchange rate appreciations increased the purchasing power of ASEAN and the PRC consumers, allowing them to import more consumption goods (Thorbecke 2011).

The depreciation of the REER in Taipei,China occurred despite the fact that its current account surplus averaged almost 9% of GDP between 2005 and 2013.

Figure 5. **Consumption Imports per Person**
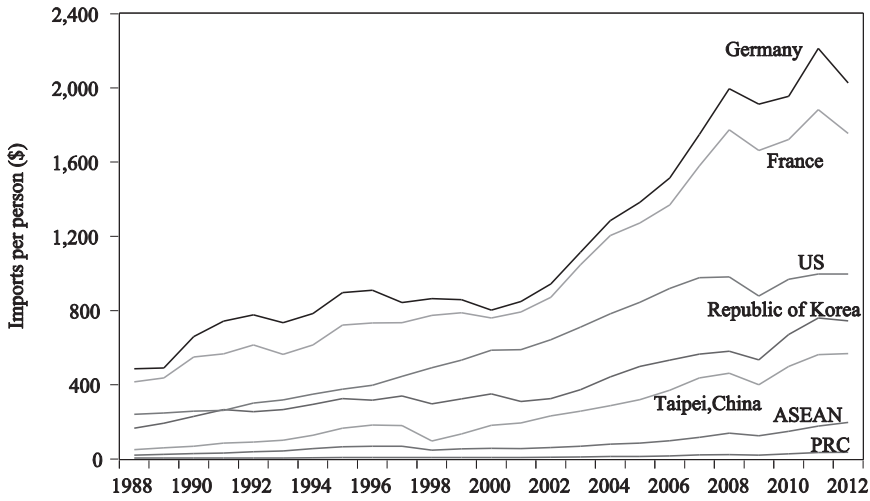
ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.
Notes: ASEAN refers to Indonesia, Malaysia, the Philippines, and Thailand. Consumption goods comprise the following categories: beverages, carpets, cars, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.
Source: CEPII-CHELEM database and calculations by the author.

Figure 6. **Real Effective Exchange Rates in ASEAN; the PRC; and Taipei,China**
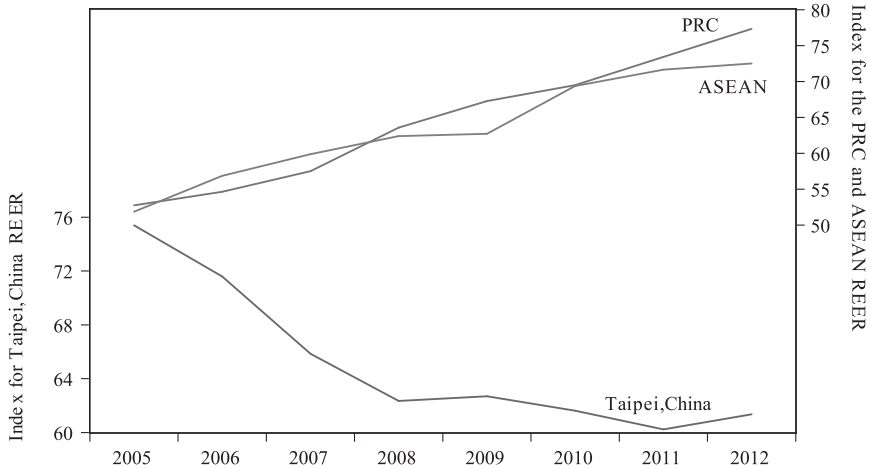
ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, REER = real effective exchange rate.
Notes: ASEAN includes Malaysia, the Philippines, and Thailand. The exchange rate values in 2005 equal 75.4 for Taipei,China; 51.9 for ASEAN; and 52.8 for the PRC.
Source: CEPII-CHELEM database.

Foreign exchange reserve accumulation by the central bank kept the NT dollar from appreciating. The PRC also increased its holdings of foreign reserves by $508 billion in 2013 alone, and by $3 trillion between 2006 and 2013. The rates of return on these external reserves are low compared to the private and social rates of return available from investments in the domestic economy. Summers (2006) reported that returns on US Treasury securities are close to zero when measured in Asian currencies. Fang et al. (2012), on the other hand, reported that the return to an additional year of education in the PRC equaled 20% per year.

Investing in education is especially crucial in the rural sector. Today's rural Chinese students will be the urban workers of the future. Their families are often poor and cannot afford to send their children to school. Making education available to them would yield high returns to society.

Investing in education is also necessary because the appreciation of the renminbi and ASEAN currencies shown in Figure 6 caused a large decrease in labor-intensive exports such as furniture, footwear, toys, and sporting goods (Thorbecke and Zhang 2009). To offset this, emerging Asia needs to assimilate new technologies and move up the value chain. Urata, Matsuura, and Wei (2006) reported that technology transfer from MNCs to workers in emerging economies increases when the workforce becomes better educated. Investing in education will help companies in emerging Asia to assimilate new technologies and move up the value chain.

Rozelle (2010) underscored the importance of education in promoting innovation and productivity growth. To accomplish this goal, he noted that students in the PRC need to acquire skills in mathematics, science, English, and computers.

Rozelle (2010) also observed that the PRC should begin investing when children are young. Most rural children cannot afford preschool, and elementary school attendance is hampered by poor accessibility and long, dangerous commutes. Bad health, sanitation, nutrition, and psychology management also restrict students' ability to learn. Prevalent problems such as anemia, vitamin deficiencies, visual difficulties, and worms can be remedied inexpensively. For instance, one multivitamin with iron can address both anemia and vitamin deficiencies, and only costs about $0.03 per student per day (Rozelle 2010).

High school tuition in the PRC is expensive at 20 times the per capita annual income of the rural poor and little financial aid is available. Because of this, only one in four rural students finishes high school. In neighboring economies such as Japan; the Republic of Korea; and Taipei,China, almost 100% of students finish high school. College tuition in the PRC is prohibitively expensive at 60 times the annual per capita income of the rural poor. Only 3% of rural students are able to attend a tier 1 or tier 2 university (Rozelle 2010). Facilitating education would help the PRC to keep climbing the ladder of comparative advantage.

Investing in human capital in ASEAN is also essential to foster creative industries. These economies need to progress from labor-intensive assembly operations

to the engineering and design aspects of production. To achieve this, it is necessary for children to receive adequate nutrition, healthcare, and primary education. It is also desirable that high school students receive high quality education in science and math, and that university students receive scientific and engineering training. The educational system should focus on providing students with marketable skills that businesses need. ASEAN governments can help coordinate this process.

Thus, there is a significant need to invest in education. Rather than channeling trillions of dollars into investments in US securities, the returns to Asia and its people would be higher if they invested in rural education, nutrition, and healthcare. In addition, as the Asian Development Bank (ADB) has often argued, consumption would grow if precautionary reasons for savings, such as inadequate provision of education and healthcare, were remedied.

The investment climate in ASEAN is also plagued by corruption. The World Economic Forum (2013) surveyed more than 10,000 executives and found corruption as one of the two biggest concerns in doing business in Malaysia, the Philippines, and Thailand. For the Philippines, respondents also singled out poor infrastructure as among their biggest concerns. MNCs have shifted production out of the Philippines to other locations because of poor infrastructure and the high cost of electricity. Improving the investment climate in ASEAN could help attract and retain MNCs and lead to more technology assimilation by local workers. A detailed discussion on improving the investment climate in emerging Asia is available in Kawai and Lee (2015).

The discussion above focused on promoting economic growth as a means of increasing consumption imports.[6] Another question is whether per capita consumption imports are less than one would expect given the level of income. Table 3 presents data on consumption imports per person relative to GDP per person for all 84 economies included in the CEPII-CHELEM database. In 2012, the PRC ranked the lowest out of all 84 economies with a ratio of 0.0059, or less than 10% of the average of 0.059 for the other 83 economies. The PRC is thus an outlier.

This suggests that structural factors are leading to underconsumption and underimporting of final goods. One factor is tariffs on consumption imports into the PRC and other protectionist obstacles. At the 2014 Asia Pacific Economic Co-operation (APEC) Summit, the PRC's President Xi Jinping proposed a Free Trade Agreement for the Asia Pacific (FTAAP). This would promote freer trade among the 21 Pacific Rim nations that are members of APEC. By lowering the level of import protections, it would enable Chinese consumers to purchase more from abroad.[7]

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[6]I am indebted to two anonymous referees for the discussion in this paragraph and the two following paragraphs.

[7]Other free trade initiatives such as the Regional Comprehensive Economic Partnership among 16 East Asian economies would have a similar effect.

Table 3. **Consumption Imports per Capita Relative to GDP per Capita**

Economy	(Consumption Imports per Capita)/ (GDP per Capita)	Rank
Kyrgyz Republic	0.461	1
Malta	0.153	2
Estonia	0.152	3
Belgium	0.150	4
Cyprus	0.134	5
Latvia	0.126	6
Slovakia	0.121	7
Bosnia and Herzegovina	0.106	8
Paraguay	0.102	9
Slovenia	0.0975	10
Lithuania	0.0975	11
The Netherlands	0.0928	12
Viet Nam	0.0923	13
Czech Republic	0.0899	14
Hong Kong, China	0.0897	15
Hungary	0.0893	16
Macedonia	0.0866	17
Bulgaria	0.0832	18
Ireland	0.0803	19
Albania	0.0746	20
Austria	0.0744	21
Switzerland	0.0729	22
Serbia and Montenegro	0.0716	23
Ukraine	0.0713	24
Croatia	0.0667	25
Iceland	0.0625	26
Poland	0.0577	27
Romania	0.0570	28
Portugal	0.0567	29
Denmark	0.0556	30
Luxembourg	0.0550	31
Tunisia	0.0535	32
Uruguay	0.0529	33
Kenya	0.0516	34
Bolivia	0.0511	35
Singapore	0.0506	36
Cote d'Ivoire	0.0492	37
Malaysia	0.0490	38
Belarus	0.0486	39
Germany	0.0484	40
Finland	0.0448	41
Libya	0.0448	42
United Kingdom	0.0447	43
Kazakhstan	0.0445	44
France	0.0442	45
Spain	0.0439	46

Continued.

Table 3. *Continued.*

Economy	(Consumption Imports per Capita)/ (GDP per Capita)	Rank
Sweden	0.0434	47
Greece	0.0419	48
Cameroon	0.0405	49
Thailand	0.0388	50
Chile	0.0378	51
Taipei,China	0.0366	52
Canada	0.0366	53
Philippines	0.0363	54
Morocco	0.0356	55
Ecuador	0.0353	56
Italy	0.0351	57
New Zealand	0.0346	58
Brunei Darussalam	0.0339	59
Israel	0.0316	60
Saudi Arabia	0.0302	61
Gabon	0.0286	62
Sri Lanka	0.0286	63
Russian Federation	0.0284	64
Algeria	0.0280	65
Norway	0.0278	66
Egypt	0.0276	67
Venezuela	0.0274	68
Republic of Korea	0.0252	69
Peru	0.0247	70
Australia	0.0226	71
Nigeria	0.0217	72
Mexico	0.0214	73
Turkey	0.0202	74
United States	0.0193	75
Japan	0.0192	76
Bangladesh	0.0192	77
Colombia	0.0189	78
Argentina	0.0138	79
Indonesia	0.0124	80
Pakistan	0.0120	81
Brazil	0.00951	82
India	0.00762	83
People's Republic of China	0.00588	84

GDP = gross domestic product.

Notes: The table presents data on consumption imports per capita divided by GDP per capita. Consumption imports comprise the following categories: beverages, carpets, cereal products, cinematographic equipment, clocks, clothing, consumer electronics, domestic electrical appliances, knitwear, miscellaneous manufactured articles, pharmaceuticals, photographic equipment, preserved fruit and vegetable products, preserved meat and fish products, soaps and perfumes (including chemical preparations), sports equipment, toiletries, toys, and watches.

Source: CEPII-CHELEM database.

The PRC's regulatory distortions also favor investment at the expense of consumption. The central government, in the 2013 Third Plenum blueprint, vowed to change this incentive structure. For instance, the PRC caps the interest rate that households can earn on deposits. These and other banking sector regulations have resulted in an artificially low cost of capital to large firms, stimulating investment. At the same time, as Muellbauer (2014) noted, the value of savings accounts equals four times annual disposable income and the interest rate caps suppress household income and spending. The government is determined to liberalize deposit rates.[8] As another example, large parts of the services sector are shielded from competition. Allowing open markets to play a larger role will help increase labor-intensive employment and thus raise incomes and consumption for many workers. The 2013 Third Plenum blueprint proposed that markets play a "decisive role" in allocating resources. As a third example, external costs associated with pollution in the PRC have not been internalized. Firms produce more pollution than the socially optimal amount. The PRC's citizens pay huge costs in terms of health problems and a lower life expectancy due to pollution.[9] The central government has recently attached a high priority to reducing pollution. By following through with their proposed reforms, the PRC can help to change the incentive structure that favors firms and production at the expense of consumers and consumption.

V. Conclusion

East Asia is characterized by intricate production and distribution relationships. MNCs in ASEAN; Japan; the Republic of Korea; and Taipei,China produce sophisticated, technology-intensive intermediate goods and ship them to the PRC for assembly by low-skilled workers. The finished products are then exported disproportionately to Europe and the US.

The GFC showed the danger of depending on the West as an engine of growth. When demand in Europe and the US plummeted after Q3 2008, Asia's exports collapsed. Thus, Asia was not able to decouple from the West.

ADB and others have noted the importance of channeling final goods not only to Europe and the US, but also to Asian consumers. This would provide a second growth locomotive and reduce the exposure of Asian economies to slowdowns outside of the region. It would also allow Asian workers to enjoy more of the fruits of their own labor.

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[8] Huang, Li, and Wang (2015) noted that before interest rates can be liberalized, commercial bank reform is necessary to prevent the emergence of reckless competition.

[9] Researchers at Peking University have found that air pollution in the PRC reduces people's life expectancy by 5.5 years (Kaiman 2013). Others have reported that pollution has contaminated between 8% and 20% of the PRC's arable land and led to "cancer villages" where citizens die young because of exposure to toxins (Chin and Spegele 2013).

This paper investigates whether Asian economies are importing fewer final consumption goods than one would expect. To do this, it uses the gravity model, which is a workhorse for estimating bilateral trade flows.

The results indicate that the PRC and ASEAN are now importing more final goods than predicted by the model. On the other hand, emerging Asia's consumption imports are far less than the imports of developed economies. To channel more goods to consumers in the region, Asia needs to continue developing.

One key step in accomplishing this would be to invest in human capital, beginning at a young age. Private and social returns are much higher for these domestic investments than for investments in US Treasury securities. Further accumulation of foreign exchange reserves would thus lead to a misallocation of resources. If Asian central banks reduced their interventions in foreign exchange markets, any resulting exchange rate appreciations would increase the purchasing power of Asian citizens and allow them to consume more.

The Chinese character for country is a jade (a precious stone) surrounded by a boundary. We can think of the precious stone as representing the people of the PRC and the boundary the borders of the country. The PRC would receive a higher expected return and face lower risks in renminbi terms by investing in the health, education, and welfare of the people within its borders rather than by investing further in foreign exchange reserves and other external assets. The government should focus especially on rural education and on remedying economic deficiencies in ways that would benefit the nontradable sector.

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

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