

The Effect of Exchange Rate Changes on China's Labor-Intensive Exports

Prepared for the ADBI Conference on Recent
Exchange Rate Movements and Policy Issues
February 25, 2009

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Introduction

- ❑ China's exports grew 22 percent per year between 2005 and 2008.
 - ❑ It's current account surplus exceeded 9 percent of GDP in 2006, 11 percent in 2007, and 10 percent in 2008.
 - ❑ It's capital account surplus exceeded 3 percent of GDP in 2007 and the first half of 2008.
 - ❑ Many believe that China faces a fundamental disequilibrium in its balance of payments and that the renminbi should appreciate.
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Why China's Leaders Have Resisted Appreciation (Ito, 2008)

- ❑ China argues that appreciation would greatly reduce labor-intensive exports.
 - ❑ Chinese policy makers claim margins for these goods are razor thin and thus that appreciation would decimate these industries.
 - ❑ The government also resists appreciation because it is concerned about losing competitiveness relative to other exporters.
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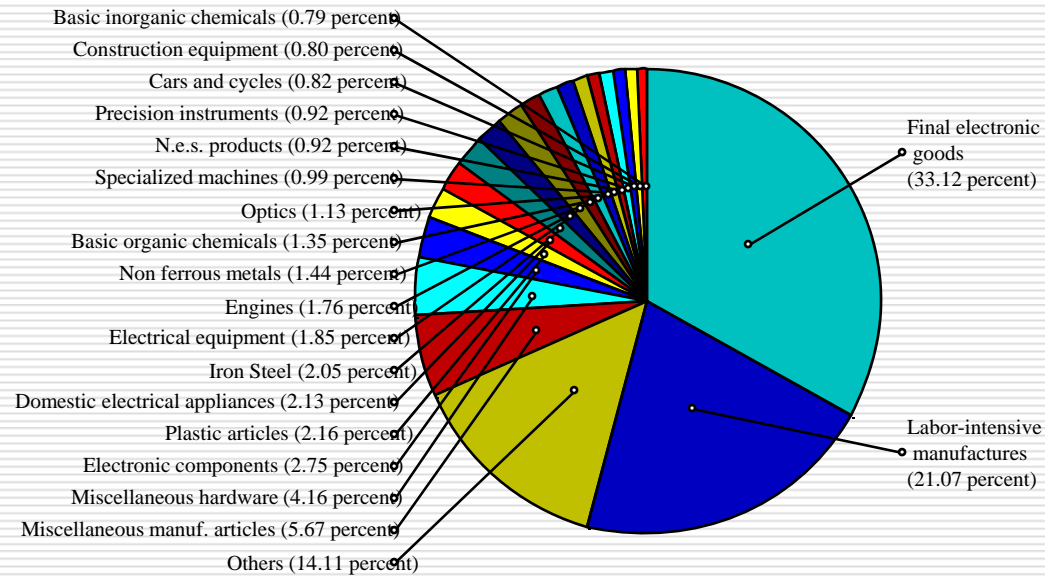
How Would an RMB Appreciation Affect Ordinary and Processed Exports?

- Processed exports are produced using intermediate goods that are imported duty free. Ordinary exports are produced primarily using domestic inputs.
 - Marquez and Schindler (2008), Thorbecke and Smith (2008), and Cheung, Chinn, and Fujii (2007) report that an RMB appreciation causes a larger decline in ordinary exports than in processed exports.
 - Larger effect on ordinary exports makes sense since more of the value-added of ordinary exports than of processed exports comes from China.
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Does China Compete with Other Countries in Third Markets?

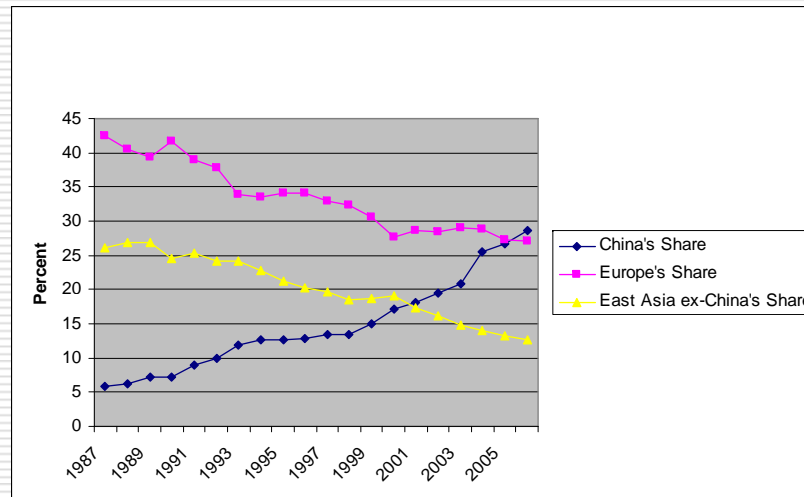
- ❑ Bénassy-Quéré and Lahrière-Révil (2003) found that a 10 percent depreciation of one East Asian exchange rate relative to other East Asian exchange rates would increase exports from the depreciating country by 5 percent
 - ❑ Thorbecke (2006) reported that a 10 percent depreciation of ASEAN currencies against the dollar would decrease China's exports to the U.S. by 7.5 percent.
 - ❑ Cheung, Chinn, and Fujii (2009) did not find a relationship between the RMB exchange rate in third countries and China's exports to the U.S.
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Figure 1. China's Exports by Category, 2006



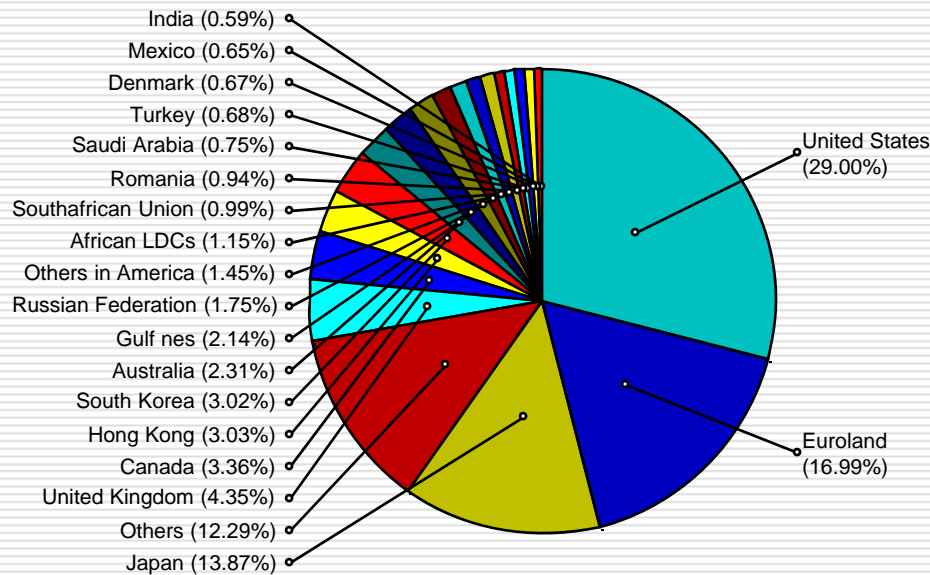
Source: CEPII-CHELEM Database

Figure 2. China, Europe, and East Asia's Shares of the World's Labor-Intensive Manufacturing Exports



Source: CEPII-CHELEM Database

Figure 3. Share of China's Exports of Labor-Intensive Manufactures Going to Individual Countries and Regions in 2006

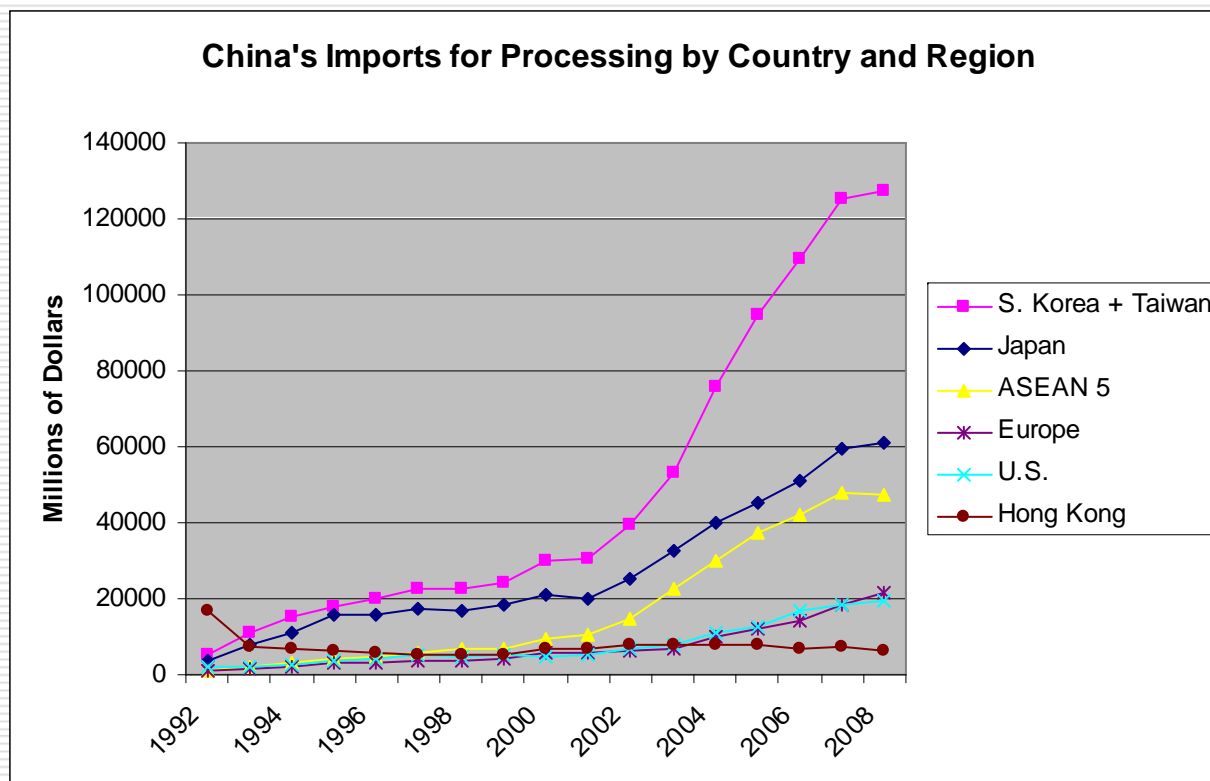


Source: CEPII-CHELEM Database

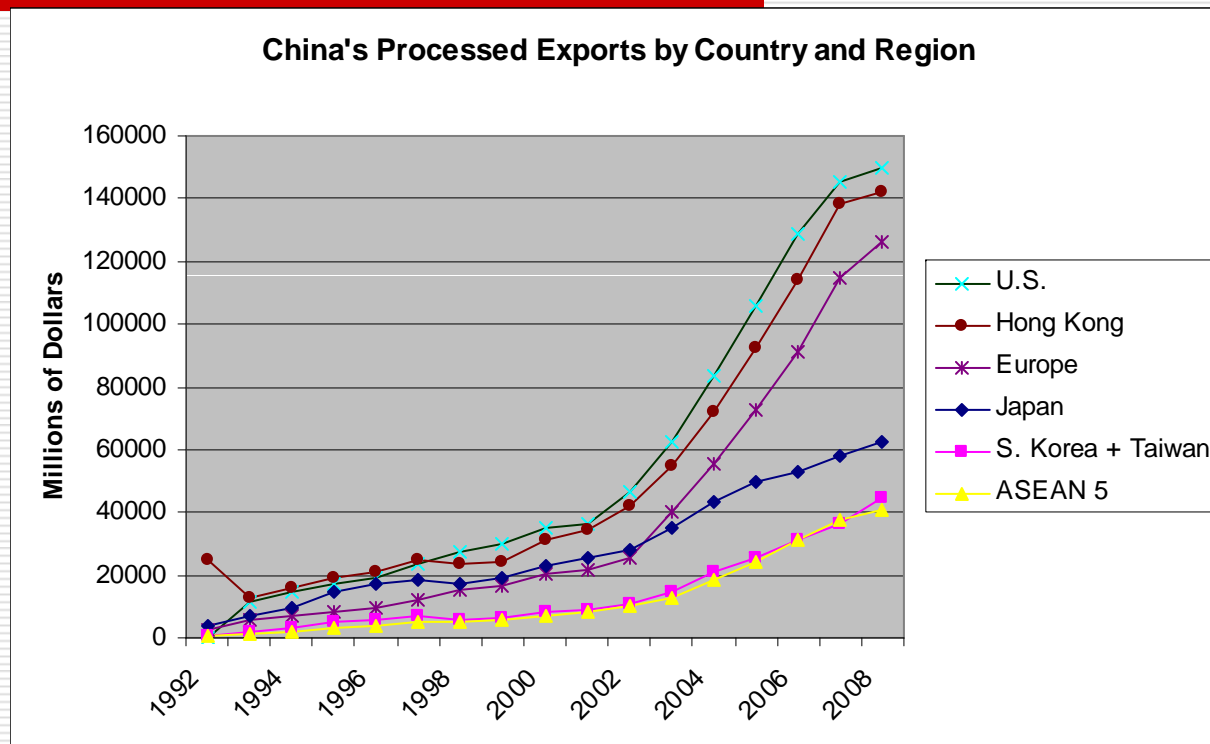
China's Labor-Intensive Exports

- 24 percent of China's exports were labor-intensive manufactures (defined as carpets, clothing, fabrics, furniture, knitwear, leather, and yarns).
 - Labor-intensive manufactures are produced largely using China's domestic inputs. Koopmans, Wang, and Wei (2008) report that China's value-added is approximately 70 percent.
 - In 2006, China surpassed Europe to become the leading exporter of these goods. China exported 29 percent of the world's exports of labor-intensive manufactures, while Europe exported 27 percent.
 - 30 percent of China's exports went to the U.S., 17 percent to the Euroland, and 14 percent went to Japan.
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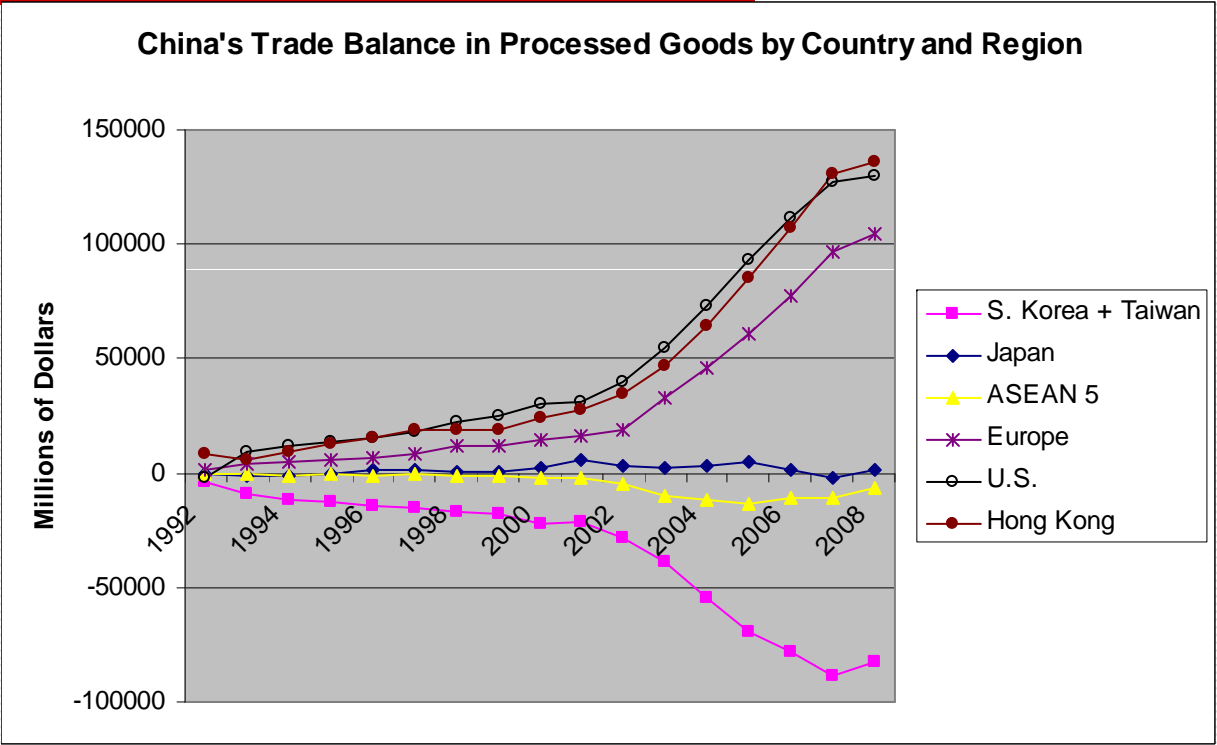
How Has the Crisis Affected China's Exports and Imports?



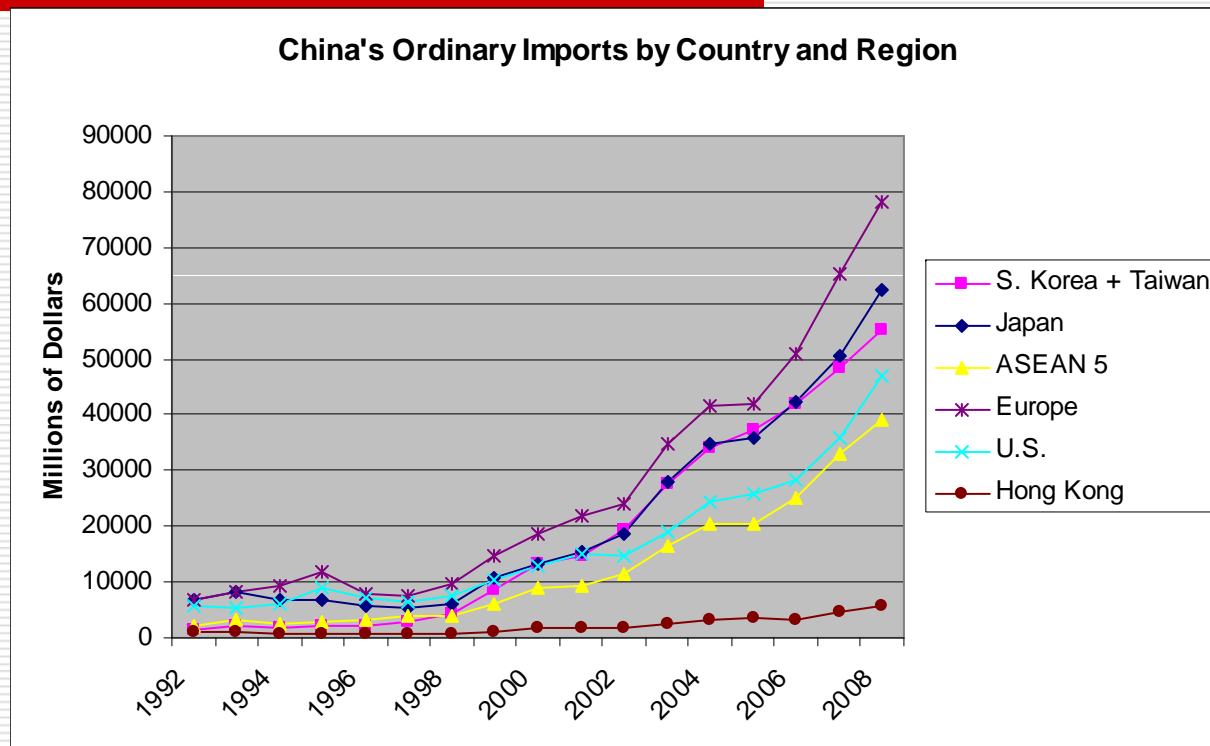
Source: China Customs Statistics



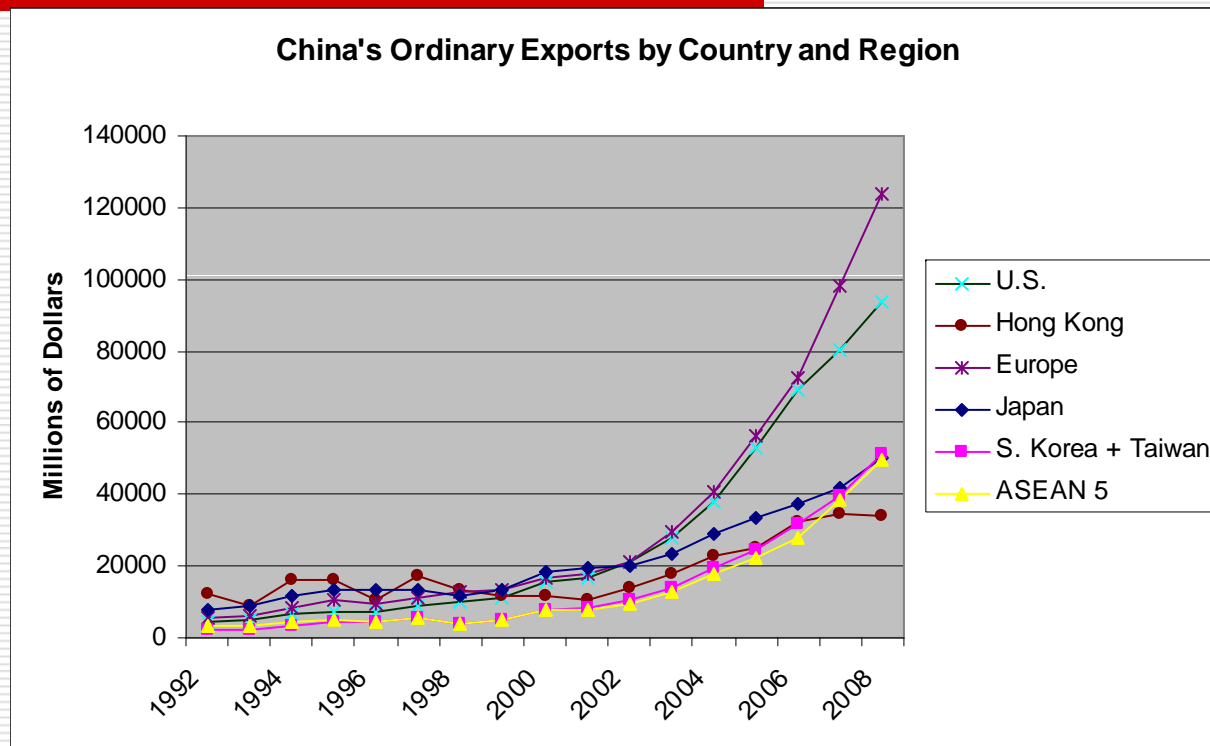
Source: China Customs Statistics



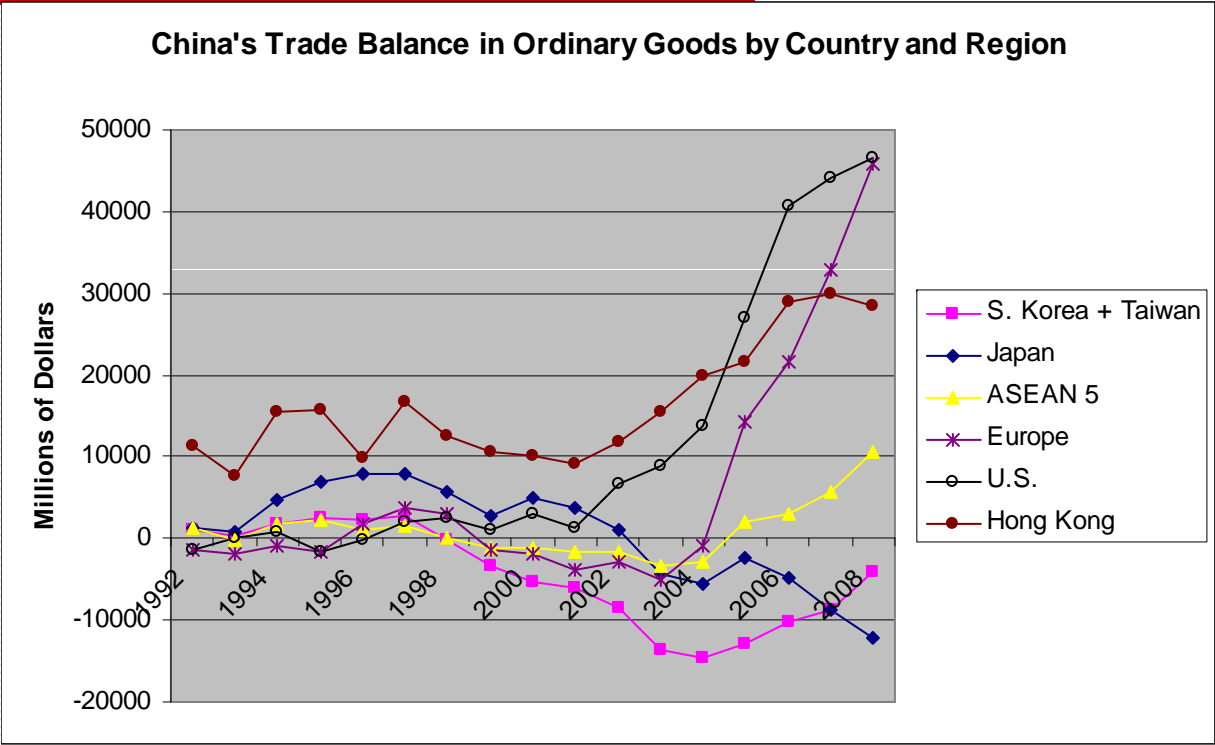
Source: China Customs Statistics



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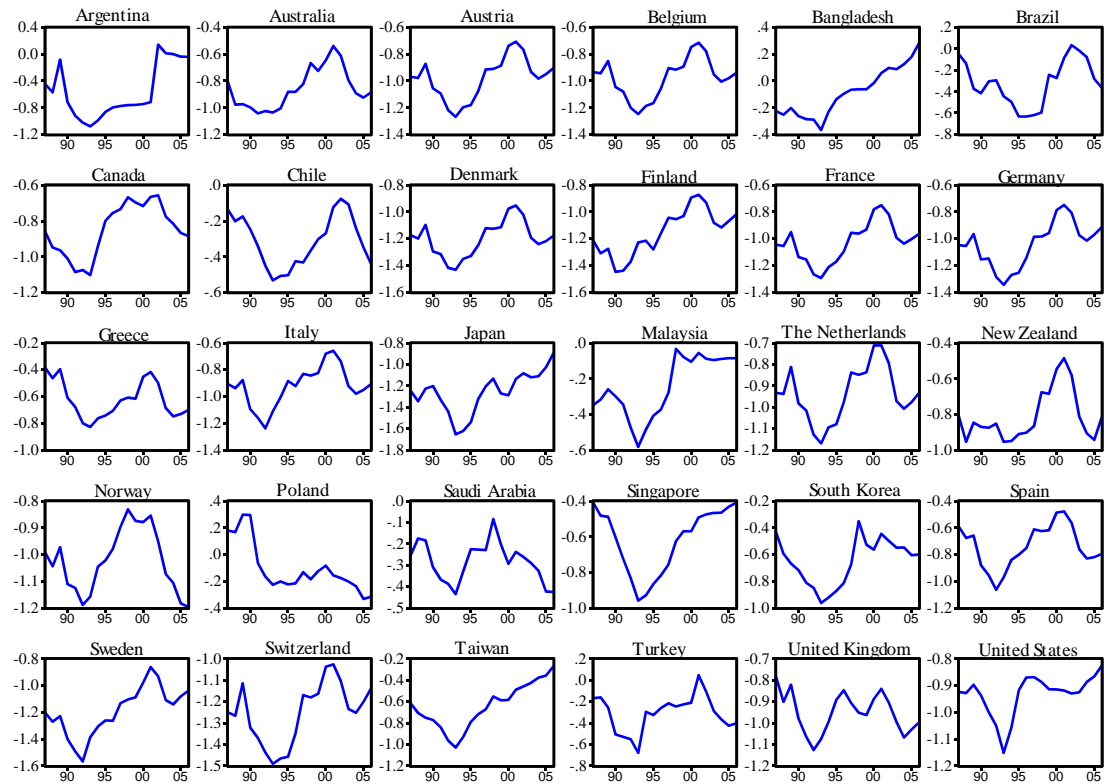
China's Exports and Imports in the Crisis

- Processing trade is slowing down rapidly. Imports for processing, processed exports, and China's imbalances in processed trade are falling rapidly.
 - Ordinary trade are growing rapidly. In particular China's ordinary exports to Europe increased 23 percent in 2008 and China's trade surplus in ordinary goods with Europe approached \$50 billion in 2008.
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Econometric Approach

- ❑ Difficult to estimate exchange rate elasticities because the bilateral RMB/dollar rate and the real effective RMB rate have not fluctuated much.
 - ❑ Look at China's exports to 30 countries over 1987-2006 period.
 - ❑ Has been substantial variation cross-sectionally and over time in RMB rate relative to 30 different countries.
 - ❑ This approach should help to identify exchange rate coefficients.
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Figure 4. CEPII-CHELEM Real Exchange Rates between China and 30 Importing Countries, 1987-2006.



Imperfect Substitutes Framework

- The quantity of China's exports *demanded* depends on income in the other countries and the price of China's exports relative to the price of domestically produced goods in those countries. The quantity of exports *supplied* by China depends on the export price relative to China's price level.
- By equating supply and demand we can derive export equations:

$$ex_t = a_{10} + a_{11}rer_t + a_{12}y_t + \varepsilon_{1t} \quad (1)$$

Identification of Trade Elasticities

- An infinite supply elasticity would make it possible to identify the parameters in equation (1). China has 150 to 200 million redundant rural laborers. Tens of millions more who join the labor force each year or are underemployed in the urban sector. Large pool of workers should enable Chinese exporters to increase supply at constant prices.
 - Demand pressures began pushing up costs and export prices in China in 2007 (CBO, 2008). Since this increase in the “China price” occurred after the sample period used here, it should not affect our ability to identify the parameters in equation (1).
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Bilateral and Weighted Exchange Rates

- China's labor-intensive manufacturing exports should depend on the RMB exchange rate, since they are produced primarily using domestic inputs.
 - China's exports may also depend on the exchange rates in other countries exporting labor-intensive goods. To test for this we construct a weighted exchange rate.
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Weighted Exchange Rate

- To calculate a weighted exchange rate for countries that compete with China we use shares of exports from 17 other leading exporters of labor-intensive manufactures.

- Suppose in 2006 Italy provided 10 percent of labor-intensive exports from 17 other leading exporters. Italy would then have a weight of 10 percent in 2006. To explain exports to a country such as Argentina, the bilateral exchange rate between Italy and Argentina would be multiplied by 0.10. The other 16 exporters would be given appropriate weights. The weighted exchange rate for Argentina would equal: $w_{i,2006} rer_{i,Argentina,2006} = \sum_{i=1}^{17} w_{i,2006} * rer_{i,Argentina,2006}$

- In the same way, w_{rer} can be calculated for the other 29 countries and for the other 19 years.

- To calculate weighted exchange rates in this way we need to measure the bilateral exchange rates using a common numeraire. We do this using CEPII real exchange rates, which are comparable both cross-sectionally and over time.
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Data

- Annual data on labor-intensive exports from China to 30 countries over the 1987-2006 period were obtained from the CEPII-CHELEM database.
 - Exports were deflated using the U.S. Bureau of Labor Statistics (BLS) price deflator for the appropriate categories.
 - Data on the bilateral RMB real exchange rate (rer) with the importing country and real income in the importing country (y) were from the CEPII-CHELEM database. All variables are estimated in natural logs.
 - Data on the Chinese capital stock were obtained from Bai, Hsieh, and Qian (2006).
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Estimation

- Estimate model using panel DOLS.
 - Include one lead and lag in the estimation.
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Equation to be Estimated

□
$$ex_{j,t} = \beta_0 + \beta_1 rer_{j,t} + \beta_2 wrer_{j,t} + \beta_3 y_{j,t} + \beta_4 K_t + \beta_5 Time + \beta_6 WTO_t + \sum_{1,k} a_{1,k} \Delta rer_{j,t-k} + \sum_{2,k} a_{2,k} \Delta wrer_{j,t-k} + \sum_{3,k} a_{3,k} \Delta y_{j,t-k} + \sum_{4,k} a_{4,k} \Delta K_{t-k} + \mu_j + u_{i,t}$$

where:

- $ex_{j,t}$ represents real exports of labor intensive goods from China to country j ,
 $rer_{j,t}$ represents the bilateral real exchange rate between China and country j ,
 $wrer_{j,t}$ represents the weighted exchange rate between the 17 other leading exporters of labor-intensive exports and country j ,
 $y_{j,t}$ equals real income in the importing country,
 K_t denotes the Chinese capital stock in manufacturing,
Time is a time trend
WTO is a dummy variable,
 μ_j is a country j fixed effect
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Table 1. Panel DOLS Estimates of China's Exports of Labor-Intensive Manufactures to 30 Countries over the 1987-2006 Period

Bilateral RER	-1.84***	-1.65***	-1.83***	-1.60***
	(0.15)	(0.12)	(0.15)	(0.12)
Competitor's RER	0.91***	0.85***	0.92***	0.86***
	(0.24)	(0.24)	(0.24)	(0.24)
Real GDP	1.82***	1.75***	1.82***	1.73***
	(0.31)	(0.32)	(0.31)	(0.30)
Capital Stock	1.12***		1.15***	
	(0.11)		(0.11)	
WTO Dummy			-0.03	-0.08*
			(0.05)	(0.05)
Time		0.13***		0.13***
		(0.01)		(0.01)
Adjusted R-Squared	0.94	0.94	0.94	0.94
No. of Observations	508	508	508	508

Notes: Heteroskedasticity-consistent standard errors are in parentheses.
 *** (**) [*] denotes significance at the 1% (5%) [10%] level.

Results for Labor-Intensive Manufactures

- The exchange rate elasticity is negative and statistically significant, implying that an appreciation of the RMB reduces exports. The coefficients imply that a 10 percent appreciation of the RMB would reduce ordinary exports by 16-18 percent. This elasticity may be large because profit margins for ordinary exports are thin, and thus cost increases arising from exchange rate changes cause a large drop in output.
 - The coefficient on the exchange rate among competitors is positive and statistically significant, implying that an appreciation among countries competing with China would increase China's exports. The coefficients imply that a 10 percent appreciation of the the weighted exchange rate would increase China's exports by 8-9 percent.
 - The income elasticity is positive and statistically significant, implying that an increase in income in importing countries will increase exports. The coefficients imply that a 10 percent increase in income in the importing country will increase exports by 18 percent.
 - The coefficient on the Chinese capital stock variable is statistically significant and the coefficient on the WTO marginally significant in one specification.
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Table 2. Panel DOLS Estimates of China's Exports of Labor-Intensive Manufactures to 30 Countries over the 1987-2006 Period

Industry			
Independent variables	Leather Goods	Clothing	Knitwear
Bilateral RER	-1.67*** (0.29)	-1.66*** (0.32)	-2.35*** (0.46)
Competitor's RER	0.94*** (0.26)	0.23 (0.40)	0.58 (0.48)
Real GDP	2.52*** (0.50)	4.29*** (0.35)	4.02*** (0.35)
Capital Stock	0.96*** (0.19)	0.56*** (0.16)	0.99*** (0.20)
Adjusted R-Squared	0.94	0.90	0.92
No. of Observations	504	502	498

Notes: Heteroskedasticity-consistent standard errors are in parentheses.
 *** (**) [*] denotes significance at the 1% (5%) [10%] level.

Table 2 (continued). Panel DOLS Estimates of China's Exports of Labor-Intensive Manufactures to 30 Countries over the 1987-2006 Period

Independent variables	Industry		
	Furniture	Yarns & Fabrics	Carpets
Bilateral RER	-2.30*** (0.17)	-1.32*** (0.23)	-1.37*** (0.22)
Competitor's RER	1.03*** (0.22)	1.53*** (0.22)	1.40*** (0.33)
Real GDP	2.52*** (0.32)	1.87*** (0.23)	1.83*** (0.36)
Capital Stock	2.08*** (0.06)	0.67*** (0.11)	0.92*** (0.10)
Adjusted R-Squared	0.97	0.89	0.89
No. of Observations	490	507	503

Notes: Heteroskedasticity-consistent standard errors are in parentheses.
 *** (**) [*] denotes significance at the 1% (5%) [10%] level.

Results for Labor-Intensive Manufactures Disaggregated by Industry

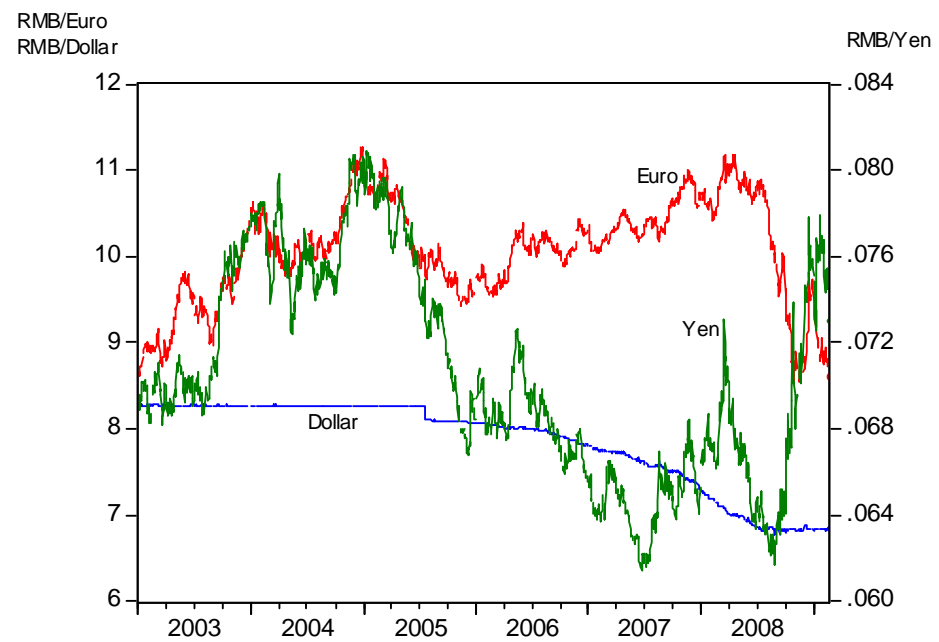
- The coefficient on the bilateral RMB exchange rate and the competitors' exchange rates are broadly consistent with the results using aggregated data.
 - The coefficient on income is larger in every case using disaggregated data.
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Implications

- An appreciation of the RMB would cause a substantial decrease in China's exports of labor-intensive manufactures. This supports the claim that profit margins for these goods are thin.
 - A depreciation of competitors' exchange rates would cause a large fall in exports. Thus fear of losing competitiveness may have prevented the Chinese authorities from letting the currency appreciate more.
 - A decrease in income in importing countries would cause a large drop in China's exports. China is thus exposed to a slowdown in the rest of the world.
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Policy Implication

- ❑ The slowdown in the rest of the world will cause exports to fall. Expansionary fiscal policy in China thus seems appropriate.
 - ❑ The RMB/Euro rate has important effects on exports from China and Europe. The 35 percent depreciation of the RMB relative to the Euro up to September 2008 crowded out Europe's exports.
 - ❑ European officials have discussed linking the absence of exchange rate liberalization in China with protectionism. A better solution for China and Europe may be if China moves to a multiple currency, basket-based reference rate with a wider band around the reference rate.
 - ❑ This would allow the RMB to appreciate against the euro and ease pressure on European exporters.
 - ❑ It would also bring greater stability to the Euro/RMB rate.
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Nominal RMB Exchange Rate versus the Yen, Euro, and Dollar

Source: Federal Reserve Bank of St. Louis FRED Database

Thank You
