The Impact of a Common Currency on East Asian Production Networks and China's Exports Behavior

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THESIS

- Economic interdependency within East Asia has been growing stronger in relation to the growth.
- Capital and technology have become increasingly mobile since the early 1990s, while the condition of labor mobility is largely attained by vertical fragmentation of production processes across borders in East Asia.
- The region is an optimum currency area (OCA), but East Asian countries have national currencies linked by flexible exchange rates.
- This study conjectures that a common currency, not flexible exchange rates between national currencies, would reduce flexibility in relative prices within East Asia. Its impact would be far greater for exports that are produced along the regional production networks.
- In order to test the hypothesis, this paper estimates the effect of a common currency on China's processing and ordinary exports separately.
- The results validate the hypothesis. The findings show that the production and exporting of processing exports is 20 percent below the potential, only because the region does not share a fixed-exchange rate system.

Previous literature and limitations

- The empirical gravity model is the workhorse, where the effect of a common currency is captured by a dummy variable.
- The most common estimate implies that a membership in a currency union would triple bilateral trade between member countries—$(e^{1.38}-1)\approx 3.0$ (Rose and Engel, 2002; Frankel and Rose, 2002).
- The most credible estimate is 58 percent trade creating effect of currency union for the Euroland countries (Rose and van Wincoop, 2001, based on a fixed effect estimate of the Anderson and van Wincoop gravity model).
- Limitations:
  - a cross-country database with a *de facto* fixed exchange rates accounting for a small percent of total observations;
  - a dummy variable representation is non-random in a large dataset; an *ex-post* analysis of a fixed exchange rate system;
  - one cannot estimate *ex ante* effect of a fixed exchange rate system on trade of a particular country, when the country belongs to an optimum currency area, but without a currency union.
  - the role of regional organization of production is ignored in the literature.

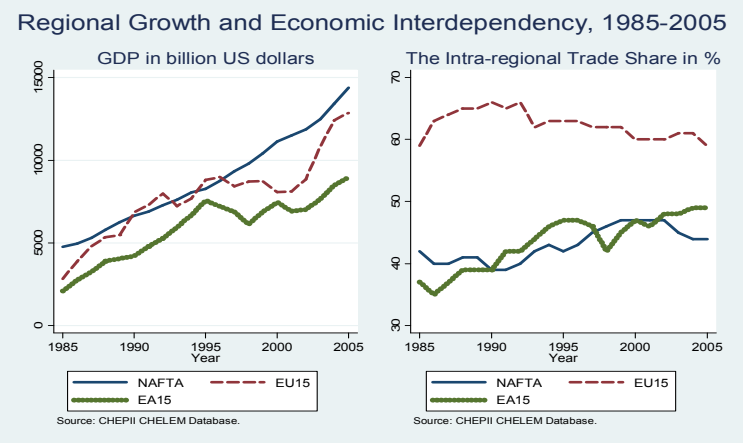
The present study

- This paper offers both a conceptual framework and its empirical application in order to obtain *ex ante* effect of a common currency arrangement on East Asian production networks and China's exports.
- The paper obtains both short-run dynamics and long-run relations for China's processing and ordinary exports separately.
- They are distinguished because the processing exports are produced along the regional production networks, while the ordinary exports are produced mainly by using local inputs.
- The paper also conducts comparative static implications of intra-regional RER flexibility, which is otherwise the lack of a common currency, for East Asian production networks.

Production networks and the evolving pattern of economic interdependency in East Asia

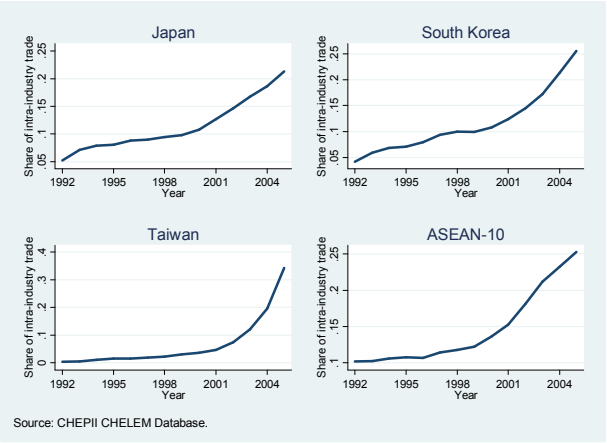
- East Asian production networks underlie fragmentation of product value chain across borders.
- IBM CEO Sam Palmisano called it, 'globally integrated business strategies' of MNCs. It is the principal reason for the growing economic interdependency in East Asia. Figure 1
- Greenspan (2005) remarked, "...production within Asia has evolved, with final stages of assembly and exporting to the United States and elsewhere being increasingly concentrated in China."
- The fragmentation mechanism is generally vertical intra-industry, not horizontal inter-industry.
- Trade along the production networks is called vertical intra-industry trade (VIIT). It mainly flows into China. Figure 2

Figure-1



- Three economic regions—NAFTA, EU-15 and East Asia-15. Over the 1985-2005 period, these regions grew 3.0x, 4.5x and 4.3x respectively.
- The question is whether the economic interdependency has been growing stronger in relation to its growth.
- Intra-regional trade share: East Asia 37%-50%, EU-15 (about 60%) and NAFTA (about 45%).

Figure 2: Intra-industry trade intensity between China and the rest of East Asia



Source: CHEPII CHELEM Database.

Table-1
China's imports and exports in 2005 (in %)

Partner Import categories	World	Japan (1)	S. Korea & Taiwan (2)	ASEAN-5 (3)	Hong Kong (4)	East Asia (5=1+2+3+4)	United States	EU-15	Rest of the World
2005									
Total imports	100.0	15.2	23.0	10.9	1.9	50.9	7.4	10.7	31.1
Ordinary imports	42.4	5.4	5.7	3.1	0.5	14.8	3.9	6.4	17.3
Imports for processing	41.5	6.9	14.4	5.7	1.2	28.1	1.9	1.8	9.7
Others	16.1	2.9	2.9	2.1	0.1	8.1	1.5	2.4	4.1

Partner Export categories	World	Japan (1)	S. Korea & Taiwan (2)	ASEAN-5 (3)	East Asia (4=1+2+3)	Hong Kong	United States	EU-15	Rest of the World
2005									
Total Exports	100.0	11.0	6.8	6.3	24.1	16.3	21.4	17.3	20.9
Ordinary Exports	41.3	4.4	3.2	2.9	10.5	3.3	6.9	7.4	13.2
Processed Exports	54.7	6.5	3.4	3.2	13.1	12.2	13.9	9.5	6.0
Others	4.0	0.1	0.2	0.2	0.5	0.9	0.6	0.4	1.7

Source: Updated from Rahman and Thorbecke (2007) and China Customs Statistics, 2006.

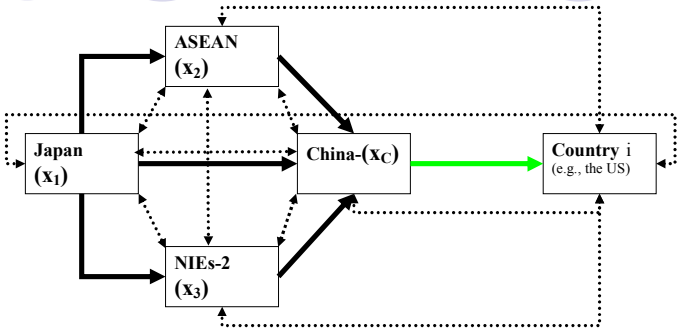
Table 1 (contd.)

China's multilateral trade account balance –2005 (in billions of U.S. dollars)

Partner Trade categories	World	Japan (1)	S. Korea & Taiwan (2)	ASEAN-5 (3)	East Asia (4=1+2+3)	Hong Kong	United States	EU-15	Rest of the World
2005									
Trade Account Balance	102.0	-16.4	-99.8	-23.8	-140.1	112.3	114.3	61.4	-45.8
Ordinary Trade	35.4	-2.5	-12.9	2.0	-13.4	21.6	26.9	14.4	-14.0
Processing Trade	142.5	4.5	-69.3	-13.3	-78.1	85.1	92.9	60.4	-17.9
Others	-75.9	-18.5	-17.7	-12.4	-48.6	5.6	-5.6	-13.4	-13.9

Source: As shown in Panel A.
Notes: China's bilateral trade surplus against Hong Kong is considered as China's bilateral trade surplus against the U.S. and EU-15.

Figure 3: Schematic view of production networks and real exchange rate relationships



Modeling of observed exports from China

-Standard two-country trade model is described by the following system of equations:

$$Q_{ci}^{x} = A\left(p_{ci}^{x}\right)^{b}\left(gdp_{c}\right)^{c} \qquad b>0, \quad c\neq 0 \qquad \text{(A1)}$$

$$Q_{ic}^{m} = B\left(p_{ic}^{m}\right)^{d}\left(gdp_{i}\right)^{e} \qquad d<0, \quad e>0 \qquad \text{(A2)}$$

$$p_{ic}^{m} = \left(\frac{P_{ic}^{m}}{P_{i}}\right) = \left(\frac{P_{ci}^{x}}{P_{c}}\cdot\frac{P_{c}}{E_{ci}P_{i}}\right) = p_{ci}^{x}\cdot RER_{ci} \qquad \text{(A3)}$$

$$Q_{ci}^{x} = Q_{ic}^{m} = Q_{ci} \qquad \text{(A4)}$$

-Eq.(4) is the equilibrium condition for the export market. Its solution for real value of observed exports from c to i is shown below:

$$\tilde{Q}_{ci} = \left(Q_{ci}\cdot p_{ci}^{x}\right) = \left[A^{-(1+d)}B^{(1+b)}gdp_{c}^{-c(1+d)}gdp_{i}^{e(1+b)}RER_{ci}^{d(1+b)}\right]^{1/(b-d)}$$
$$= G\left(gdp_{c}, gdp_{i}, RER_{ci}\right) \qquad \text{(A5)}$$

Modeling of observed exports ...

-Eq. (A5) does not recognize that $\tilde{Q}_{ci}$ is the gross value of exports that are produced across fragmented production blocks.

-Let v_{ci} represents the incremental value-added by the exporting country and Σv_{ji} be the value of imorted intermediate goods from the rest of East Asia, where j=1,⋯,N.

-The study formulates (N+1) structural equations of supply and a coresponding (N+1) structural equations of demand. Each equation is thus for the incremental value-added.

-At equilibrium, it gives (N+1) reduced-form solutions:

$$\tilde{v}_{ji} = v_{ji}\cdot p_{ji}^{v} = g_{j}\left[gdp_{j}, gdp_{i}, RER_{ji}\right], \qquad j=1,\cdots,N$$

$$\tilde{v}_{ci} = v_{ci}\cdot p_{ci}^{v} = g_{c}\left[gdp_{c}, gdp_{i}, RER_{ci}\right] \qquad \text{(A6)}$$

-An Armington aggregation of the equilibrium conditions (A6) gives the the reduced – form equation for the gross real value of final exports $\tilde{Q}_{ci}$:

$$\tilde{Q}_{ci} = \left[\left(\Sigma_{j}\omega_{jc}\tilde{v}_{jc}^{\alpha}\right) + \left(1-\Sigma_{j}\omega_{jc}\right)\tilde{v}_{ci}^{\alpha}\right]^{1/\alpha} = G'\left(\overline{gdp}_{j}, gdp_{c}, gdp_{i}, \overline{RER}_{jc}, RER_{ci}\right) \qquad \text{(A7)}$$

?

Conceptual framework ...

-Eq.(7) includes arguments $\overline{RER}_{jc}$ and RER_{ci}, $\because RER_{ji} \equiv \left(RER_{jc} \cdot RER_{ci}\right)$.

$$\overline{RER}_{jc} = \left(\Sigma_j \omega_{jc} \cdot RER_{jc}^{\alpha}\right)^{1/\alpha} \Rightarrow \lim_{\alpha \to 0}\left(\Sigma_j \omega_{jc} \cdot RER_{jc}^{\alpha}\right)^{1/\alpha} = \Pi_j \mathrm{RER}_{\mathrm{jc}}^{\omega_{\mathrm{jc}}} \text{ [L'Hôpital's rule]}$$

$$ln\left(\overline{RER}_{jc}\right) = \Sigma_j \omega_{jc} \cdot ln\left(RER_{jc}\right) = RER_w \qquad (*)$$

-Excluding the set of other controls, a stochastic formulation of Eq.(A7) is:

$$y_i = \beta_1 RER_w + \beta_2 RER_{ci} + u_i, \quad \beta_1 < 0, \ \beta_2 < 0 \qquad (1)$$

-A hypothetical case assuming that there exists a fixed exchange rate system in East Asia is formulated below:

$$y_i = \beta_2^* RER_{ci} + v_i, \qquad \beta_2^* < 0 \qquad (2)$$

-When Eq.(2) is applied to real data, the bias is $\mathrm{plim}\left(\hat{\beta}_2^* - \beta_2\right) = \beta_1 b_{12} > 0$.

-It is the well-known omitted variable problem.

-If the region were indeed an OCA, RER_w would cease to be relevant, Eq.(2) will be the true specification.

$$y_i = \beta_2 RER_{ci} + v_i \qquad (2a)$$

Conceptual framework ...

-The long-run effect of a common currency arrangement on China's exports is:

$\phi^* = \left|\beta_1 + \beta_1 b_{12}\right|$. If $b_{12} \to 0$, $\phi^* \to \left|\beta_1\right|$.

$$H_a: \quad \left|\beta_1 + \beta_1 b_{12}\right|_{Pro.Xp} \succ \left|\beta_1 + \beta_1 b_{12}\right|_{Ord.Xp}$$

-Estimating actual volume of exports relative to the potential volume:

(i) Measure of Exchange risk: $d_t = \left|RER_{wt} - \overline{RER}_{wt}\right|$

(ii) Adjustment term: $exp\left(d_t\right)^{\phi^*}$

(iii) If either $d_t \to 0$ or $\phi^* \to 0$, $exp\left(d_t\right)^{\phi^*} \to 1$; Otherwise $exp\left(d_t\right)^{\phi^*} < 1$.

(iv) Potential volume of exports: $y_{it}^* = \dfrac{\hat{y}_{it}}{exp\left(d_t\right)^{\phi^*}}, \qquad y_{it}^* \geq \hat{y}_{it}, y_{it}$

(v) Actual trade relative to the potential trade: $\dfrac{y_{it}}{y_{it}^*}$.

The dynamic panel data model

-It is an autoregressive and distributed lag (ADL) formulation:

$$y_{it} = \sum_{k=1}^{p} \alpha_k y_{it-k} + \boldsymbol{\beta}'(\mathbf{L})\mathbf{x}_{it} + \boldsymbol{\gamma}'\mathbf{z}_i + \eta_i + \boldsymbol{\delta}_i'\mathbf{d}_{it} + u_{it},$$
$$t = p+1,\cdots,T;\ i = 1,\cdots,N \qquad (3)$$

-Two benchmark specifications:

$$y_{it} = \sum_{k=1}^{2} \alpha_k y_{it-k} + \beta_0 GDP_{it} + \beta_1 GDP_{it-1} + \beta_2 GDP_{it-2} + \xi_0 RER_{cit} +$$
$$\xi_1 RER_{cit-1} + \xi_2 RER_{cit-2} + \psi_0 RER_{wt} + \psi_1 RER_{wt-1} +$$
$$+ \psi_2 RER_{wt-2} + \boldsymbol{\gamma}'\mathbf{z}_i + \eta_i + \boldsymbol{\delta}_i'\mathbf{d}_{it} + u_{it} \qquad (3.1)$$

$$y_{it} = \sum_{k=1}^{2} \alpha_k^* y_{it-k} + \beta_0^* GDP_{it} + \beta_1^* GDP_{it-1} + \beta_2^* GDP_{it-2} + \xi_0^* RER_{cit} +$$
$$\xi_1^* RER_{cit-1} + \xi_2^* RER_{cit-2} + \boldsymbol{\gamma}^{*\prime}\mathbf{z}_i + \eta_i + \boldsymbol{\delta}_i^{*\prime}\mathbf{d}_{it} + v_{it} \qquad (3.2)$$

-Key features:

i. ADL terms are selected on the basis of observed minimum of AIC and/or BIC criteria so that the conditional distribution is stationary.

ii. The model does not require that the system $(y_{it}, \mathbf{x}_{it})$ is cointegrated.

iii. The specifications are more general than other restrictive long-run specifications, e.g., DOLS or FMOLS.

Estimation of dynamic panel models: pooled OLS, covariance estimators, ...

- Since the model is dynamic including fixed effects, standard estimation methods, such as pooled OLS and covariance estimators are inconsistent.
- The pooled OLS estimators are inconsistent because they assume that $E(\mathbf{x}'_{it}u_{it})=0$ and $E(\mathbf{x}'_{it}\eta_i)=0$.
- Covariance estimators are also inconsistent for reasons that the model includes lagged dependent variable and that the strict exogeneity assumption $E(\mathbf{x}'_{it}u_{it})=0$ would fail when the vector $\mathbf{x}_{it}$ is not strictly exogenous. For example, the strict exogeneity assumption fails if either $E(\mathbf{x}'_{it}u_{is})\neq 0$ for $s\leq t$ or $E(\mathbf{x}'_{it}u_{is})\neq 0$ for $s<t$.
- The present study thus uses GMM approach for dynamic models of panel data.
- The basic assumption is that $E(u_{it})=E(u_{it}u_{is})=0$, for all $t\neq s$.

First-diff GMM estimators...

◦ Following Arellano and Bond (1991), the assumptions that u_{it}'s are serially uncorrelated and that the vector $\mathbf{x_{it}}$ is, say, predetermined in the sense that $E(\mathbf{x}'_{\mathbf{it}}u_{is}) \neq 0$ for $s < t$ or zero otherwise will give rise to a set of moment conditions in the first-differenced equations.

◦ Written compactly, $E(Z_i'\Delta u_i) = 0$ for $i = 1,\cdots,N,$ where $\Delta u_i = (\Delta u_{i3},\cdots,\Delta u_{iT})',$ and the optimal matrix of instruments $Z_i = \text{diag}(y_{i1}\cdots y_{is}\mathbf{x}'_{i1}\cdots\mathbf{x}'_{is})$ for $(s = 1,\cdots,T-3)$ are valid instruments.

◦ Different exogeneity assumption about the vector $\mathbf{x_{it}}$ will lead to a varying set of moment conditions.

◦ GMM estimators that are based on these moment conditions are called the first-differenced GMM estimators.

System GMM estimators...

◦ However, if the autoregressive parameter approaches to unity and/or the relative variance of the fixed effects η_i increases to infinity, i.e., $(\sigma_\eta^2/\sigma_u^2) \to \infty,$ the first-differenced GMM estimators can be further biased than the within estimates.

◦ Based on the stationary properties that $E(y_{it+p}\eta_i) = E(y_{it+q}\eta_i)$ and $E(x_{it+p}\eta_i) = E(x_{it+q}\eta_i)$ for all p and $q,$ Blundell and Bond (1999) showed that one could use an additional set of moment conditions related to the levels equations.

◦ Continuing with ADL(2,2) model including weakly exogenous $\mathbf{x}_{it}$, the moment conditions related to the levels equations can be shown to be $E(\Delta y_{it-1}u_{it}) = 0$ *and* $E(\Delta\mathbf{x_{it}}u_{it}) = 0$ for $t = 4,...,T.$

◦ A system of equations combining both the differenced equations and the levels equations is then estimated and the resultant estimator is called the system GMM estimator.

Results (Table 4)—Dynamic estimates for China's processing exports to 33 countries, 1992-2005

	Fully specified model				Hypothetical model
	1	2	3	4	5
Independent Variables	Pooled OLS	Fixed-Effect	GMM1	GMM2	GMM2
Lagged real exports$_{i(t-1)}$	0.988***	0.774***	0.791***	0.776***	0.663***
	(0.073)	(0.084)	(0.07)	(0.07)	(0.09)
GDP of importer$_{it}$	2.466***	2.480***	2.674***	2.560***	2.494***
	(0.49)	(0.48)	(0.56)	(0.51)	(0.57)
GDP of importer$_{i(t-1)}$	-3.037***	-2.382***	-2.515***	-2.091**	-1.465**
	(0.77)	(0.74)	(0.72)	(0.80)	(0.70)
Bilateral RMB RER$_{ci,t}$	-0.784***	-0.799***	-0.718***	-0.754***	-0.584***
	(0.19)	(0.19)	(0.19)	(0.18)	(0.16)
Intra-regional RER flexibility$_{wt}$	-1.691***	-1.368***	-1.088***	-1.306***	
	(0.44)	(0.27)	(0.22)	(0.37)	
Intra-regional RER flexibility$_{w(t-2)}$	-0.799**	-0.738***	-0.439*	-0.715*	
	(0.32)	(0.25)	(0.22)	(0.35)	
m1			-2.94***	-2.91***	-2.81***
m2			-0.29	-0.28	-1.11
Hansen J Statistic			0.009	0.59	0.11
P-value (d.f)			(10)	(28)	(21)
No. of Groups	33	33	33	33	33
Estimation Period	1992-2005	1992-2005	1992-2005	1992-2005	1992-2005
No. of obs.	396	396	396	396	396
Significance tests: *** p<0.01, ** p<0.05, * p<0.1.					

Results (Table 5)—Dynamic estimates for China's ordinary exports to 33 countries, 1992-2005

	Fully specified model				Hypothetical model
Independent Variables	Pooled OLS	Fixed-Effect	GMM1	GMM2	GMM2
Lagged real exports$_{i(t-1)}$	0.657***	0.504***	0.572***	0.537***	0.545***
	(0.10)	(0.10)	(0.08)	(0.11)	(0.08)
Lagged real exports$_{i(t-2)}$	0.288***	0.198**	0.342***	0.384***	0.301**
	(0.10)	(0.09)	(0.09)	(0.10)	(0.11)
GDP of importer$_{it}$	1.795***	1.823***	1.768***	1.564**	1.850***
	(0.47)	(0.49)	(0.63)	(0.64)	(0.60)
Bilateral RMB RER$_{ci,t}$	-0.861***	-1.001***	-0.821***	-0.889***	-0.749***
	(0.13)	(0.14)	(0.16)	(0.15)	(0.12)
Bilateral RMB RER$_{ci,(t-1)}$	0.526***	0.417***	0.500**	0.480***	0.204
	(0.15)	(0.15)	(0.19)	(0.17)	(0.14)
Bilateral RMB RER$_{ci,(t-2)}$	0.414***	0.233*	0.411***	0.352**	0.559***
	(0.12)	(0.14)	(0.11)	(0.13)	(0.14)
Intra-regional RER flexibility$_{wt}$	-0.853***	-1.028***	-0.455**	-0.676**	
	(0.32)	(0.25)	(0.21)	(0.33)	
Intra-regional RER flexibility$_{w(t-1)}$	0.409*	0.348	0.436*	0.398*	
	(0.23)	(0.23)	(0.22)	(0.23)	
Intra-regional RER flexibility$_{w(t-2)}$	-0.904***	-1.119***	-0.701***	-0.937***	
	(0.24)	(0.22)	(0.16)	(0.22)	
m1			-1.71*	-1.84**	-1.68*
m2			-0.08	-0.34	0.06
Hansen J Statistic			0.009	0.289	0.087
P-value (d.f)			(10)	(28)	(21)
No. of Groups	33	33	33	33	33
Estimation Period	1992-2005	1992-2005	1992-2005	1992-2005	1992-2005
No. of obs.	396	396	396	396	396
Significance tests: *** p<0.01, ** p<0.05, * p<0.1.					

Results (Table 6)—Estimates of long-run parameters (based dynamic estimates of the fully specified model)

Specifications and estimations methods (Dynamic model Eq.(3.1) only) Panel A: China's processing exports to 33 countries—1992-2005	Income of importing country ($\hat{\beta}$)	Bilateral RMB real exchange rate ($\hat{\xi}$)	Intra-regional RER flexibility ($\hat{\psi}$)
(1) Within estimates	2.497***	−1.131***	−4.503***
	(0.772)	(0.374)	(0.572)
(2) GMM system estimates (both the RER vars are treated strictly exogenous)	1.011***	−0.257	−5.432***
	(0.153)	(0.321)	(1.002)
(3) GMM system estimates (both the RER vars are treated predetermined)	0.975***	−0.934**	−8.465**
	(0.180)	(0.481)	(4.558)
Panel B: China's ordinary exports to 33 countries—1992-2005			
(1) Within estimates	0.219	−1.175***	−6.022***
	(0.727)	(0.338)	(0.696)
(2) GMM system estimates (both the RER vars are treated strictly exogenous)	1.064***	1.049**	−8.376
	(0.103)	(0.397)	(5.743)
(3) GMM system estimates (both the RER vars are treated predetermined)	0.946***	−0.715	−15.389
	(0.269)	(1.607)	(31.130)

Notes: *** p<0.01, ** p<0.05, * p<0.1

Results (Table 7)—Trade effect of a fixed exchange rate system in East Asia (Estimates for China's processing exports)

Importer IDs	Importing country	$\bar{y}_i$ (in million USD) [1]	$\bar{y}_i^*$ (in million USD) [2]	$\bar{y}_i^* - \bar{y}_i$ (in million USD) [3]	t-ratio [4]	$(\bar{y}_i / \bar{y}_i^*)$ [5]
101	Argentina	179	243	63.6	2.4	0.74
102	Australia	2112	2508	396.1	3.7	0.84
103	Austria	241	396	154.2	5.6	0.61
104	Belgium	1520	1691	170.7	2.2	0.90
105	Brazil	692	769	76.3	1.1	0.90
106	Canada	2183	2651	468.3	2.7	0.82
107	Denmark	511	669	158.0	4.8	0.76
108	Finland	749	785	36.7	0.7	0.95
109	France	2812	3912	1099.7	4.0	0.72
110	Germany,FR	8065	9809	1744.0	3.3	0.82
111	Greece	235	321	86.8	2.8	0.73
112	Hong Kong	42306	48473	6167.8	1.7	0.87
113	Iceland	8	13	5.1	1.9	0.61
114	Indonesia	793	844	51.3	0.9	0.94
115	Ireland	712	667	-45.2	-0.7	1.07
116	Italy	1599	2290	690.8	9.0	0.70

Continued.....

Results (Table 7)—Trade effect of a fixed exchange rate system in East Asia (Estimates for China's processing exports)

Importer IDs	Importing country	$\bar{y}_i$ (in million USD) [1]	$\bar{y}_i^*$ (in million USD) [2]	$\bar{y}_i^* - \bar{y}_i$ (in million USD) [3]	t-ratio [4]	$(\bar{y}_i / \bar{y}_i^*)$ [5]
117	Japan	27891	42850	14958.8	8.8	0.65
118	Korea Rep	7241	9439	2198.8	7.2	0.77
119	Luxembourg	326	161	-164.8	-1.6	2.02
120	Malaysia	2189	2388	199.6	1.9	0.92
121	Mexico	972	965	-7.6	-0.1	1.01
122	Netherlands	6175	5487	-687.8	-1.0	1.13
123	New Zealand	219	273	54.3	4.3	0.80
124	Philippines	918	878	-40.0	-0.5	1.05
125	Portugal	110	156	46.2	5.4	0.70
126	Russia	636	932	296.7	5.0	0.68
127	Singapore	4565	5313	748.3	2.8	0.86
128	Spain	997	1384	386.4	6.4	0.72
129	Sweden	470	722	252.4	6.6	0.65
130	Taiwan pro	4075	6533	2457.5	10.5	0.62
131	Thailand	1397	1472	75.5	1.2	0.95
132	United Kingdom	4726	6084	1358.7	6.1	0.78
133	United States	46779	52286	5507.8	1.8	0.89
	Overall	**174400**	**213365**	**38965**	**2.35**	**0.81**

Major findings

- In short-run:
  - the impact elasticity of RER_w is −1.31 and that of RER_{ci} is −0.75 for the panel of processing exports.
  - The coefficient of RER_{ci} is −0.58 in the hypothetical model. The upward bias term ($\beta_1 b_{12}$) is −0.20.
  - The overall trade effect of RER_w on the processing exports is ($\beta_1 + \beta_1 b_{12} = -1.51$).
  - the impact elasticity of RER_w is −0.67 and that of RER_{ci} is −0.89 for the panel of ordinary exports.
  - The overall trade effect of RER_w on the ordinary exports is ($\beta_1 + \beta_1 b_{12} = -0.75$).
  - The overall trade effect of RER_w on China's processing exports is just double the corresponding effect on the ordinary exports.
- In the long-run, we consider only the fully specified model, because the bias term $\beta_1 b_{12}$ is insignificant.
  - For the panel of processing exports, the long-run effect of RER_w is −8.5, while that of a unilateral RMB appreciation is −0.93.
  - By contrast, the long-run effects, based on the consistent GMM estimates, are statistically insignificant for the ordinary exports.
- The long-run coefficient of RER_w implies that production and exporting of processing exports is 20 percent below the potential.
- In other words, a regional fixed exchange rate mechanism will enhance performance of East Asian production networks by 25 percent.

Further robustness checks

- alternative definitions of key variables—the results are unchanged.
- augmenting the model by including proxies of supply-side effects—the results provide the lower bound limit and hence conservative estimates.
- arbitrary changes in the lag-lengths—no change in the short-run dynamics, some changes in the long-run estimates.

Concluding remarks

- East Asian integration has been mainly through market mechanisms, but it has created new demand for regional institutions.
- A common currency is such an institution.
- It would capitalize the current attainment and provide a solid foundation of the kind Europe has achieved.
- The existing regime is non-optimal and not viable during a crisis period.

THANK YOU ALL