

Key Points:

- For Asia, exchange rate volatility appears to harm exports in all goods—primary, intermediate, equipment, and consumption.
- The impact on intermediate and equipments exports is most stark, especially in the smaller ASEAN+5 sub-group, highlighting the particularly pernicious effect of intraregional exchange rate volatility on the region's production networks.
- Given that intraregional exchange rate volatility hurts intraregional trade, the need for greater exchange rate cooperation and coordination among regional economies deserves closer policy consideration.

OREI Policy Briefs are based on papers or notes prepared by ADB staff. The series is designed to provide brief, nontechnical accounts of macro-financial, capital markets, regional cooperation and other relevant policy issues of topical interest, with a view to stimulate debate.

Is there a case for exchange rate policy coordination in Asia?

Hsiao Chink Tang

Email: hctang@adb.org

The breakdown of the Bretton Woods exchange rate system in 1973 heralded the beginning of floating exchange rates, which many feared would destabilize international trade and harm economic growth. Even in Asia today, this view remains widespread among authorities whose economies adopt an export-oriented growth model.

In recent years, the lack of exchange rate flexibility has taken prominence, often times as criticism for contributing to global imbalances. While policymakers generally agree on the need to rebalance their economies and are cognizant of the merits of more flexible exchange rates¹, in practice, the fear of losing competitiveness and the need to build-up international reserves seem to have trumped the former considerations.²

Notwithstanding the long history of floating exchange rate and its continued policy relevance, there is a lack of consensus both in theories and empirics on whether exchange rate volatility does or does not harm trade. This brief examines the impact of intra-Asia exchange rate volatility on intra-Asia exports in primary, intermediate, equipment, and consumption goods³—highlighting the need for greater exchange rate cooperation and coordination among regional economies.⁴

1. Rising intraregional trade especially in intermediate and equipment goods

Within ASEAN+5, intraregional trade has increased over the past three decades at the expense of trade with the rest of the world, mostly developed economies;

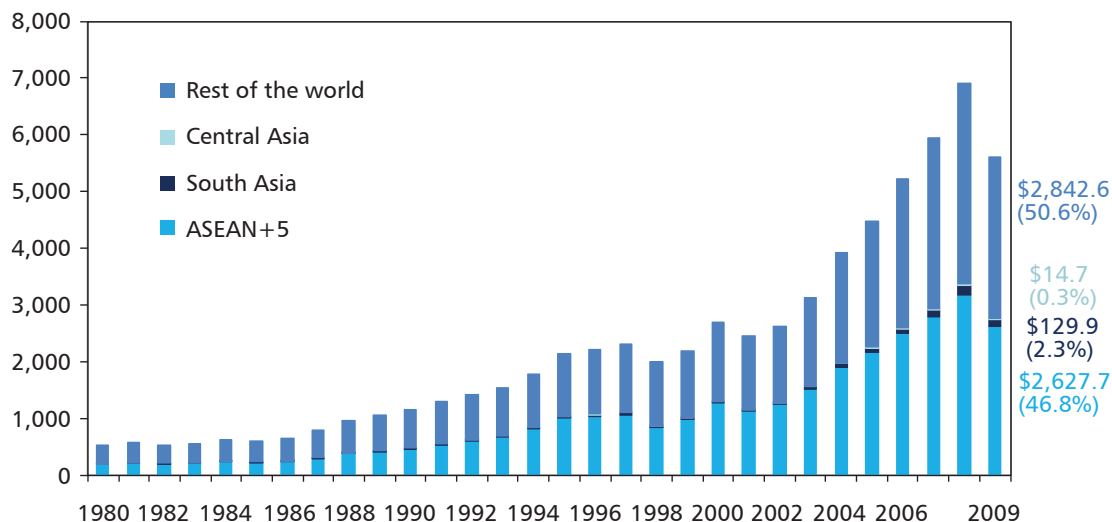
¹ Obstfeld and Rogoff (2010); Wen (2012); Zeti (2012).

² Rajan (2011); Wolf (2008).

³ The data used and classifications are from CEPII-CHELEM.

⁴ The region refers to a large group of 18 economies from the Association of Southeast Asian Nations (ASEAN), East Asia, and South Asia. In particular, there are the five larger ASEAN economies known collectively as ASEAN-5 (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) and four smaller members (Brunei Darussalam, Cambodia, the Lao People's Democratic Republic (PDR), and Viet Nam); the five East Asian economies (the People's Republic of China [PRC]; Japan; Hong Kong, China; the Republic of Korea; and Taipei, China); and the four South Asian economies (Bangladesh, India, Pakistan, and Sri Lanka). For brevity, ASEAN and East Asian economies are labeled as ASEAN+5, and ASEAN+5 and South Asia as Asia.

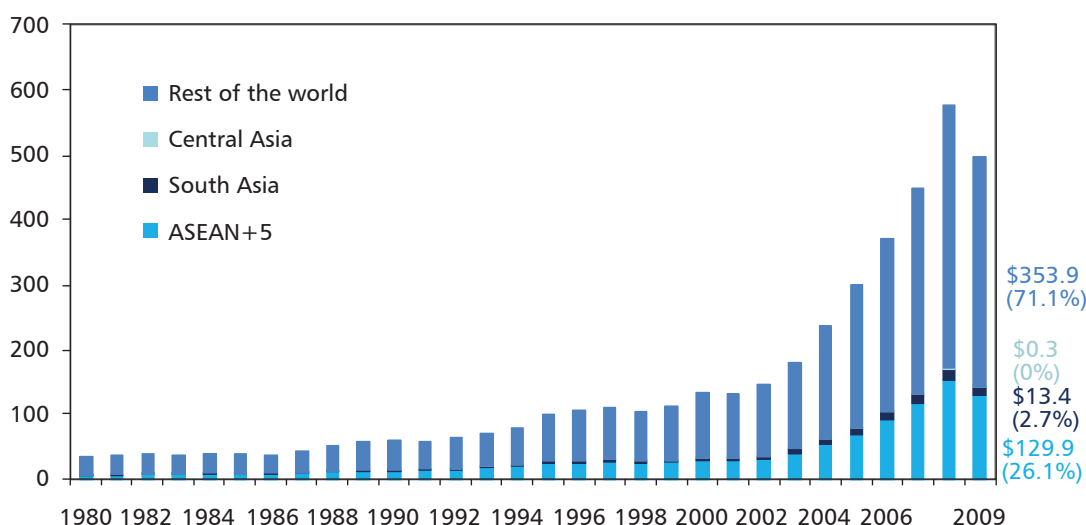
Figure 1. Total Trade between ASEAN+5 and Select Trade Partners (\$ billion)



Note: Total trade refers to sum of exports to and imports from trade partners. ASEAN+5 refers to Brunei Darussalam, Cambodia, and the Lao People's Democratic Republic; the People's Republic of China; Hong Kong, China; Japan; Indonesia; Malaysia; the Philippines; Singapore; the Republic of Korea; Taipei, China; Thailand; and Viet Nam. Central Asia refers to Kazakhstan and the Kyrgyz Republic. South Asia refers to Bangladesh, India, Pakistan, and Sri Lanka. Numbers on the right refer to share of total trade in 2009.

Source: CEPII-CHELEM.

Figure 2. Total Trade between South Asia and Select Trade Partners (\$ billion)



Note and Source: As per Figure 1.

although the latter are still the largest markets (Figure 1). ASEAN+5's trade with South Asia has remained relatively small, capturing only 2.3% of total ASEAN+5 trade in 2009.

On the other hand, South Asia's trade with ASEAN+5 (mostly exports) has grown gradually over the years, yet it has remained small at 2.7% of total South Asian trade in 2009 (Figure 2).

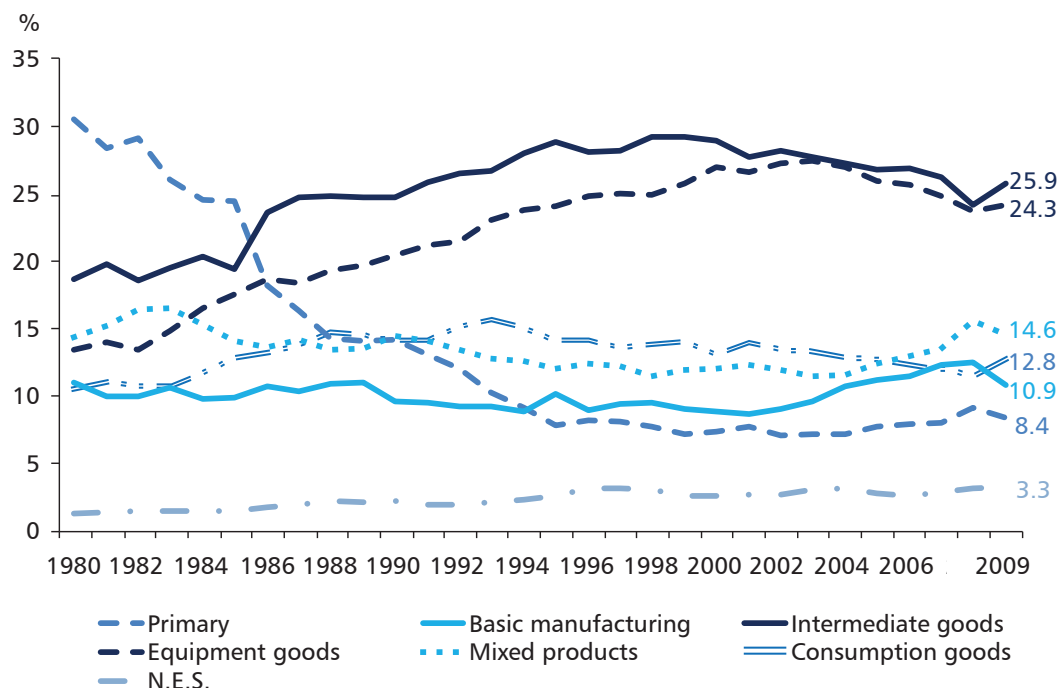
By type of goods, intra-Asia trade is dominated by intermediate and equipment goods representing about half

of total intraregional trade (Figure 3), which underscores the importance of the region's production networks.

2. Theories remain divided, but empirics on Asia are more supportive

Interestingly, theories support both a negative and positive relationship between exchange rate volatility and trade. The negative relationship—the volatility-harms-trade view—contends that a risk-averse firm facing increased exchange

Figure 3. Intra-Asia Trade by Type of Goods (%)



Note: N.E.S. refers to not elsewhere specified. Asia comprises Bangladesh; Brunei Darussalam; Cambodia; the People's Republic of China; Hong Kong, China; Japan; India; Indonesia; the Republic of Korea; the Lao People's Democratic Republic; Malaysia; Pakistan; the Philippines; Singapore; Sri Lanka; Taipei, China; Thailand; and Viet Nam

Source: CEPII-CHELEM.

rate volatility will reduce its exports due to the uncertainty in its future profitability.⁵ On the other hand, a positive relationship can exist when highly risk-averse firms faced with volatile exchange rates increase their exports due to stronger income over substitution effects⁶, and the high costs of entering and exiting export markets.⁷

The divided theoretical literature has motivated many empirical studies, which by and large remain inconclusive due to methodological differences. For instance, there has been no consensus on a standard measure of exchange rate volatility. In addition, the different levels of data disaggregation used in different studies inhibit easy cross study comparisons. Some use aggregated trade data between one country and the rest of the world, while others use disaggregated data between two countries or disaggregated data by commodity or sector.

That said, studies using aggregated data on Asia seem to have lent more support for the volatility-harms-trade view. For example, using total export volume and a single equation time series method of cointegration and/or error correction model, a negative relationship between exchange rate volatility and exports has been found in India, Indonesia, Malaysia, and the Republic of Korea;^{8,9} while a long-run negative relationship has been found in three of the East Asian countries (Japan, the Republic of Korea, and Singapore), but a positive relationship in two others (Indonesia and Thailand).¹⁰

More recent papers have employed panel data on bilateral total export volume. In a gravity model study of 11 Asian and 23 OECD economies, intra-Asia exchange rate volatility is found to have no discernible impact on exports, but a negative relationship exists between Asia-OECD exchange rate volatility and exports.¹¹ Using panel fixed-effect and random-effect models, other studies have found a negative relationship between exchange rate volatility and exports among ASEAN-[the People's Republic of] of China Free Trade Area (ACFTA) economies, and the same ACFTA economies and 13 industrialized countries.¹²

Studies on ASEAN and East Asian economies using bilateral export volume at the disaggregated level of product or sector also tend to favor the volatility-harms-trade view.¹³ Thorbecke's results show a clear adverse impact from

⁵ Clark (1973).

⁶ De Grauwe (1987).

⁷ Franke (1991); Sercu and Vanhulle (1992).

⁸ Doroodian (1999).

⁹ Doganlar (2002).

¹⁰ Poon et al. (2005).

¹¹ Benassy-Quere and Lahreche-Revil (2003).

¹² Chit (2008); Chit et al. (2010).

¹³ See Thorbecke (2008) and Hayakawa and Kimura (2009). Thorbecke adopts a panel DOLS estimation technique on the five main ASEAN countries plus the PRC; Japan; the Republic of Korea; and Taipei, China; while Hayakawa and Kimura use a gravity model on the same set of countries except that Taipei, China is replaced by Hong Kong, China.

Table 1: Asia and Its Sub-Regions: Results by Type of Goods

	Asia	ASEAN+5	ASEAN+5 without CLMV	South Asia
Primary Goods				
Real GDP of j	0.1712*	0.1977*	0.2006*	-0.0001
Bilateral real exchange rate	0.3711*	0.6281*	1.7272*	0.7781*
Volatility of exchange rate	-0.0233	-0.3460*	5.2018*	0.7446
Intermediate Goods				
Real GDP of j	0.3238*	0.4234*	0.3098*	-0.0930
Bilateral real exchange rate	-1.1900*	-1.1685*	-1.0767*	1.1027*
Volatility of exchange rate	-0.8887*	-1.5137*	-2.6425*	2.5234*
Equipment Goods				
Real GDP of j	0.3110*	0.4004*	0.3375*	-0.0413
Bilateral real exchange rate	-1.1951*	-1.5538*	-1.1355*	0.3256**
Volatility of exchange rate	-0.7738*	-1.4101*	-4.2510*	2.1192*
Consumption Goods				
Real GDP of j	0.2201*	0.2900*	0.3186*	-0.0605
Bilateral real exchange rate	-0.6198*	-0.8607*	-0.4139*	0.1578
Volatility of exchange rate	-0.3837*	-0.7626*	-1.9658*	2.4098*

Note: Asia refers to ASEAN+5 and South Asia. ASEAN+5 refers to the nine ASEAN and five East Asian economies (the People's Republic of China [PRC]; Japan; Hong Kong, China; the Republic of Korea; and Taipei, China). South Asia refers to Bangladesh, India, Pakistan, and Sri Lanka. C refers to Cambodia; L, Lao PDR; M, Myanmar; and V, Viet Nam. Panel dynamic OLS (2,2) are estimated with bias corrected standard errors. This specification is based on each dependent variable as indicated above and the right-hand side variables of real gross domestic product (GDP) of the importing country, bilateral real exchange rate, and bilateral exchange rate volatility. The values presented are the estimated coefficients of the contemporaneous right-hand side variables. All variables are in natural logarithm. Sample starts from 1984. *, **, and *** refer to 1%, 5%, and 10% levels of significance, respectively.

Source: Author's estimations.

intra-Asian exchange rate volatility on exports of electronic components. Hayakawa and Kimura also find the same for both finished machinery goods and machinery parts, with the latter being more sensitive to higher volatility. In contrast to Thorbecke and Hayakawa and Kimura, this study looks at export data at a disaggregated level that is higher than the specific product types examined by the former.

3. New evidence shows exchange rate volatility harms intra-Asia exports

Using a panel time series estimation technique called panel dynamic ordinary least squares (DOLS), that examines long-run relationships of interests, this study finds, for Asia, exchange rate volatility appears to harm exports in all goods—primary, intermediate, equipment, and consumption (Table 1). This adverse impact is most evident among intermediate and equipment goods, and is stronger in smaller groups, such as ASEAN+5 and even more so in ASEAN+5 without Brunei Darussalam, Cambodia, the Lao PDR, and Viet Nam. These findings highlight the particularly pernicious effect of intraregional exchange rate volatility on the region's production networks.

In contrast, for South Asia, exchange rate volatility seems to help trade. In general, the relative unimportance

of intra-South Asian trade suggests caution is necessary when interpreting this and other results on South Asia.

For another explanatory variable, the positive sign of higher real income of importers as leading to higher exports in all goods is in accordance with a priori. Yet, its absolute magnitude is typically smaller than that of the bilateral real exchange rate and exchange rate volatility, thus highlighting the importance of exchange rate issues in trade. Interestingly, for South Asia, the real income of the importing country is not important (mostly not significant).

On the other hand, the negative relationship between bilateral real exchange rate and exports appears to be counterintuitive.¹⁴ This is evident for all exports except primary goods in Asia and ASEAN+5. (In South Asia, the opposite is found). A plausible explanation comes from the pattern and extent of trade involving the region's production networks.^{15,16}

¹⁴ A rise in the bilateral exchange rate refers to a depreciation of the exporter's currency vis-à-vis the importer's. Thorbecke (2008) also shares the same finding. While the definition of relative prices may differ, De Grauwe (1987), Cushman (1988), Pozo (1992), and McKenzie and Brooks (1997), among others, also find the same.

¹⁵ The author thanked Willem Thorbecke for pointing this out.

¹⁶ Another explanation could be due to the J-curve effect. This was investigated, but no such evidence was found. The definition of bilateral real exchange rate might also matter. This study used the measure based on the purchasing power parity made available by CEPII-CHELEM. When an alternative measure based on the relative wholesales prices of the exporter and importer was used, the coefficient turned insignificant, although it was still negative.

A depreciation of an exporter's currency is symmetrical to an appreciation of an importer's currency. When this happens, the demand for the importer's products falls since they have become more expensive. In turn, this will translate into lower demand for parts and components/intermediate products from the importer, resulting in the fall in exports of these goods. This argument fits the results for intermediate and equipment goods well, but to a lesser extent for consumption goods. In any case, these differences are perhaps reflected in the magnitude of the exchange rate volatility, which is largest for intermediate and equipment exports, followed by consumption exports, in both Asia and ASEAN+5.

4. Greater exchange rate coordination deserves policy consideration

Given that intraregional exchange rate volatility hurts intraregional trade, and that increasing intraregional trade helps redress global payment imbalances, it follows that policymakers should be concerned about volatility. What is most striking is that the adverse impact is concentrated in intermediate and equipment goods, the two most heavily traded products in the region and key components to the region's production networks. As such, the need for greater exchange rate cooperation and coordination among regional economies deserves closer policy consideration.

References

- Benassy-Quere, A. and A. Lahreche-Revil. 2003. Trade Linkages and Exchange Rates in Asia: The Role of [People's Republic of] China. *CEPII Working Paper*. 21. Centre d'Etudes Prospectives et d'Informations Internationales.
- Chit, M.M. 2008. Exchange Rate Volatility and Exports: Evidence from the ASEAN-China Free Trade Area. *Journal of Chinese Economic and Business Studies*. 6 (3). pp. 261–277.
- Chit, M.M., M. Rizov, and D. Willenbockel. 2010. Exchange Rate Volatility and Exports: New Empirical Evidence from the Emerging East Asian Economies. *The World Economy*. 33 (2). pp. 239–263.
- Clark, P. 1973. Uncertainty, Exchange Risk, and the Level of International Trade. *Western Economic Journal*. 11. pp. 302–313.
- Cushman, D.O. 1988. US Bilateral Trade Flows and Exchange Risk During the Floating Period. *Journal of International Economics*. 24 (3–4). pp. 317–330.
- De Grauwe, P. 1987. Exchange Rate Variability and the Slowdown in Growth of International Trade. *International Monetary Fund Staff Papers*. 35 (1). pp. 63–84.
- Doganlar, M. 2002. Estimating the Impact of Exchange Rate Volatility on Exports: Evidence from Asian Countries. *Applied Economics Letter*. 9. pp. 859–863.
- Doroodian, K. 1999. Does Exchange Rate Volatility Deter International Trade in Developing Countries? *Journal of Asian Economics*. 10. pp. 465–474.
- Franke, G. 1991. Exchange Rate Volatility and International Trading Strategy. *Journal of International Money and Finance*. 10. pp. 292–307.
- Hayakawa, K. and F. Kimura. 2009. The Effect of Exchange Rate Volatility on International Trade in East Asia. *Journal of the Japanese and International Economies*. 23. pp. 395–406.
- McKenzie, M. and R.D. Brooks. 1997. The Impact of Exchange Rate Volatility on German-US Trade Flows. *Journal of International Financial Markets, Institutions, and Money*. 7 (1). pp. 73–87.
- Obstfeld, M. and K. Rogoff. 2010. Global Imbalances and the Financial Crisis: Products of Common Causes. In R. Glick and M. Spiegel, eds. *Asia and the Global Financial Crisis*. San Francisco: Federal Reserve Bank of San Francisco.
- Poon, W.-C., C.-K. Choong, and M.S. Habibullah. 2005. Exchange Rate Volatility and Exports for Selected East Asian Countries. *ASEAN Economic Bulletin*. 22 (2). pp. 144–159.
- Pozo, S. 1992. Conditional Exchange-Rate Volatility and the Volume of International Trade: Evidence from the Early 1900s. *Review of Economics and Statistics*. 74. pp. 325–329.
- Rajan, R. 2011. Management of Exchange Rate Regimes in Emerging Asia. *ADB Working Paper Series*. 322. Tokyo: Asian Development Bank Institute.
- Sercu, P. and C. Vanhulle. 1992. Exchange Rate Volatility, International Trade, and the Value of Exporting Firms. *Journal of Banking and Finance*. 16. pp. 155–182.
- Thorbecke, W. 2008. The Effect of Exchange Rate Volatility on Fragmentation in East Asia: Evidence from the Electronics Industry. *Journal of the Japanese and International Economies*. 22. pp. 535–544.
- Wen, J. 2012. Report on the Work of the Government. Premier Wen Jiabao's Speech Delivered at the Fifth Session of the Eleventh National People's Congress. 5 March.

QUICK LINKS

Asian Bonds Online

www.asianbondsonline.adb.org

Asia Regional Integration Center

www.aric.adb.org

Asian International Economists Network

www.aienetwork.org

ADB Working Paper Series on
Regional Economic Integration

[http://aric.adb.org/pdf/workingpaper/
WP90_Tang_Intra_Asia_Exchange_Rate_
Volatility.pdf](http://aric.adb.org/pdf/workingpaper/WP90_Tang_Intra_Asia_Exchange_Rate_Volatility.pdf)

To receive a policy brief from the Office of Regional Economic Integration (OREI), please send an email to orei_info@adb.org

Wolf, M. 2008. *Fixing Global Finance*. Baltimore, MD: John Hopkins University Press.

Zeti, A.A. 2012. Asia in the World—Sustaining the Region’s Transformative Momentum. Governor of the Central Bank of Malaysia’s Keynote Address at the Wharton Global Alumni Forum. Jakarta. 22 June.

About Us

OREI traces its roots to the Regional Economic Monitoring Unit (REMU)—established in the aftermath of the 1997/98 Asian financial crisis. It was upgraded and renamed OREI in April 2005, as ADB expanded its role in promoting regional cooperation and integration (RCI) throughout Asia and the Pacific.

OREI assists its developing member countries in pursuing open regionalism that serves as a building block to global integration.