

Empirical Study on Financial Cooperation in Asia: Will China and Japan Hinder Financial Integration?

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This study examines financial cooperation in Asia, and checks whether the Asian leaders, China and Japan, hinder the financial integration of Asian countries. The study adopts Feldstein and Horioka's (1980) theoretical model and the panel data econometric model to test the financial integration of the main Asian countries from 1997 to 2012. We find that both China and Japan do hinder the financial integration of Asian countries. Furthermore, China's foreign exchange regulations could be the main factor hindering the financial integration of Asian countries.

Keywords: Financial integration, Feldstein-Horioka Model, Nonstationary panel data, Asia

I. Introduction

The 1997 Asian financial crisis had a negative impact on the economies of Asian countries, although it accelerated the region's financial integration and cooperation. After the crisis, a series of regional initiatives such as the Chiang Mai Initiative (CMI), the Asian Bond Market Initiatives (ABMI), and the Asian Bond Fund (ABF) were set up, which promoted the financial integration of Asian countries greatly. Guillaumin (2009) indicates that the financial integration of Asian countries became stronger after the 1997 financial crisis. The in-depth development of Asian financial integration first leads to the efficient allocation of capital among countries in Asia. On one hand, countries in need of development funds can more easily acquire capital. On the other hand, countries that have funds to offer can benefit by investment or lending those funds. Second, financial integration can also dramatically help countries protect themselves from economic crises. Overall, governments as well as academic circles agree that financial integration is essential and beneficial for Asia.

Although financial integration developed

quickly in Asia, the degree of financial cooperation in the region lags far behind that in developed countries. Kim et al. (2006) point out that financial integration in East Asia lagged behind that in the world. Kim et al. (2007) further mention that the capital flowing in East Asia is much more difficult to integrate than that flowing in the OECD countries. Lee (2008) shows that the level of financial integration cannot catch up with the development of trade integration in East Asia. Wang (2004) indicates that the different interest rates and economic integration strategies of countries could be the biggest challenge for financial integration in Asia and that it could lead to the failure of the region's financial integration.

Therefore, the first step toward strengthening financial integration in Asia is to determine the factors that hinder it. According to Sakakibara (2003), cooperation between Japan and China is the core requirement for the success of Asian financial integration. As the leaders of Asia, China and Japan's participation in the Asian financial market may dominate the Asian financial integration. Furthermore, Zhao (2004) shows that Japan, as one of the Asian leaders, should cooperate well

with China and other Asian countries, and that the good relationship between Japan and other countries including China will benefit Asia enormously. Some observers and the governments of the two countries always emphasize the need for well-developed financial cooperation between Japan, China, and other Asian countries.

However, how do China and Japan cooperate with other Asian countries in the field of financial integration? No study has empirically analyzed this issue to draw accurate conclusions. This study aims to fill this gap and provide some empirical evidence. We examine whether China and Japan cooperate with other Asian countries well enough, and whether China and Japan hinder the financial integration of Asia.

This research is based on Feldstein & Horioka (1980) and uses some econometric methodologies to test whether China and Japan challenge the financial integration of Asia. First, we divide the main Asian countries into four groups: Asian countries¹⁾, Asian countries without China, Asian countries without Japan, and Asian countries without China and Japan. We then calculate the degree of financial integration in each group using a modified Feldstein and Horioka (1980) model. Finally, we compare the level of financial integration of Asian countries with and without China and Japan. If the level of financial integration of Asian countries with China and Japan is lower than that without China and Japan, it means that China and Japan do not cooperate well enough with other Asian countries and that they drag down the whole Asian financial integration process, supporting the view of Sakakibara (2003) and Wang (2004). Otherwise, if China and Japan cooperate well with other Asian countries in financial matters, it will overcome the “hindering integration” prediction.

This study contributes to the literature in two ways. First, this is the first empirical analysis on the issue of whether the leaders of

Asia, China and Japan, hinder regional financial integration. Second, our empirical results show that China and Japan really do hinder the Asian financial integration. Neither China nor Japan cooperate well enough with other Asian countries in financial matters.

The remainder of the paper is structured as follows: Section 2 explains the methodology used in economic and econometric models. Section 3 introduces the data source. Section 4 discusses our empirical results and findings. Section 5 summarizes the study and discusses the policy implications.

II. Methodology

1. Economic model

The methodology widely used to investigate financial integration is Feldstein and Horioka’s (1980) model. Feldstein and Horioka (1980) focus on the correlation between savings and investment by estimating the following equation:

$$(I/Y)_i = \alpha + \beta(S/Y)_i, \quad (1)$$

where i stands for the corresponding country, I investment, S savings, and Y the gross domestic product (GDP); I/Y and S/Y give the investment and savings rate, respectively. Theoretically, coefficient β is the measurement of degree of financial integration.

A small β means a higher capital mobility and higher regional financial integration, whereas a large β indicates a lower capital mobility and lower regional financial integration. From this model, I divide Asian countries into four groups: Asian countries, Asian countries without China, Asian countries without Japan, and Asian countries without China and Japan, and then calculate the coefficient β for each group. Thus, we can compare the financial integration condition of the four groups. The primary purpose of this study is to test whether China and Japan hinder the process of the financial integration of Asia.

2. Empirical models

While the basic model we use for this

research is from Feldstein and Horioka, several econometric methodologies exist in the literature to estimate equation (1). From the literature (e.g., Pedroni, 2004), we find that the panel time series methodology has many advantages over other methods. Therefore, we adopt the panel unit root test and panel regression model for our empirical estimation.

(1) Panel unit root tests

Numerous panel unit root test methodologies based on the Augmented Dickey-Fuller (ADF) test (Levin et al., 2002; Im et al., 2003) and Phillips-Perron (PP) tests (Choi, 2001; Maddala & Wu, 1999) exist in the literature. They can be used to check whether the panel data are stationary or not. We modify the Levin ADF test for panel data as follows:

$$\Delta x_{it} = \alpha_i + \beta_i x_{i,t-1} + \sum_{j=1}^{P_i} p_{ij} \Delta x_{i,t-j} + \varepsilon_{it}$$

$$\varepsilon_{it} \sim \text{i.i.d.N}(0, \sigma_i^2) \quad (2)$$

where x_{it} represents the time series savings and investment rates data for country i , and P_i is the number of lags in ADF regression.

This study adopts the Im Pesaran ADF test to robust the results of Levin ADF test. The Im Pesaran ADF test, as suggested by Im et al. (2003), assumes that coefficient β_i can be varied for different countries. Furthermore, the Fisher ADF and PP tests (Choi, 2001; Maddala & Wu, 1999) also can be used to robust the panel unit root test.

(2) Regression model

We first check whether the data are stationary or not and then proceed to estimate the coefficient β in equation (1) by the panel regression test technique using data from the four groups. The panel regression model used in this study is

$$(I/Y)_{it} = \alpha_i + \beta_i (S/Y)_{it} + \varepsilon_{it}, \quad (3)$$

where t is the time series, and $(I/Y)_{it}$ and $(S/Y)_{it}$ indicate the investment and savings rate of country i at year t . When estimating equation (3) using the data of the Asian countries, Asian countries without China, Asian countries without Japan, and Asian countries without China and Japan, we solve the

problem of White noise by calculating the White cross-section standard error. We also estimate fixed effect, random effect panel data, and pooling data regression models.

III. The data and calculation

This research covers 10 Asian economies, namely, China, Japan, South Korea, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Cambodia, and Vietnam. Note that the important ASEAN+3 member countries Brunei, Burma, and Laos are not included in our sample, mainly because too much of the countries' data is missing. All the data can be collected from the World Development Indicators of the World Bank database. Our dataset is from 1997 to 2012, mainly because, as several studies (Guillaumin, 2009) have shown, the Asian financial integration has become faster after the 1997 Asian financial crisis.

IV. Empirical results

1. Descriptive statistics

This study refers to the investment and savings rates of 10 countries. Although all these countries belong to Asia, their investment and savings rates show quite different characteristics. Table 1 gives some statistical investment and savings rate ratios of these countries. From Table 1, China's investment and savings rates are the highest; both rates are more than 0.4 (0.4609 for investment and 0.4186 for savings). Cambodia's ratios are the lowest; for example, their mean investment rate is about 0.1766 and mean saving rate around 0.1321. For Japan and other Asian countries, both the rates are between 0.2 and 0.4. In addition, for some countries, the investment rate is larger than the savings rate (e.g., China, Malaysia, Thailand, and Cambodia); for other countries, the investment rate is smaller than the savings rate.

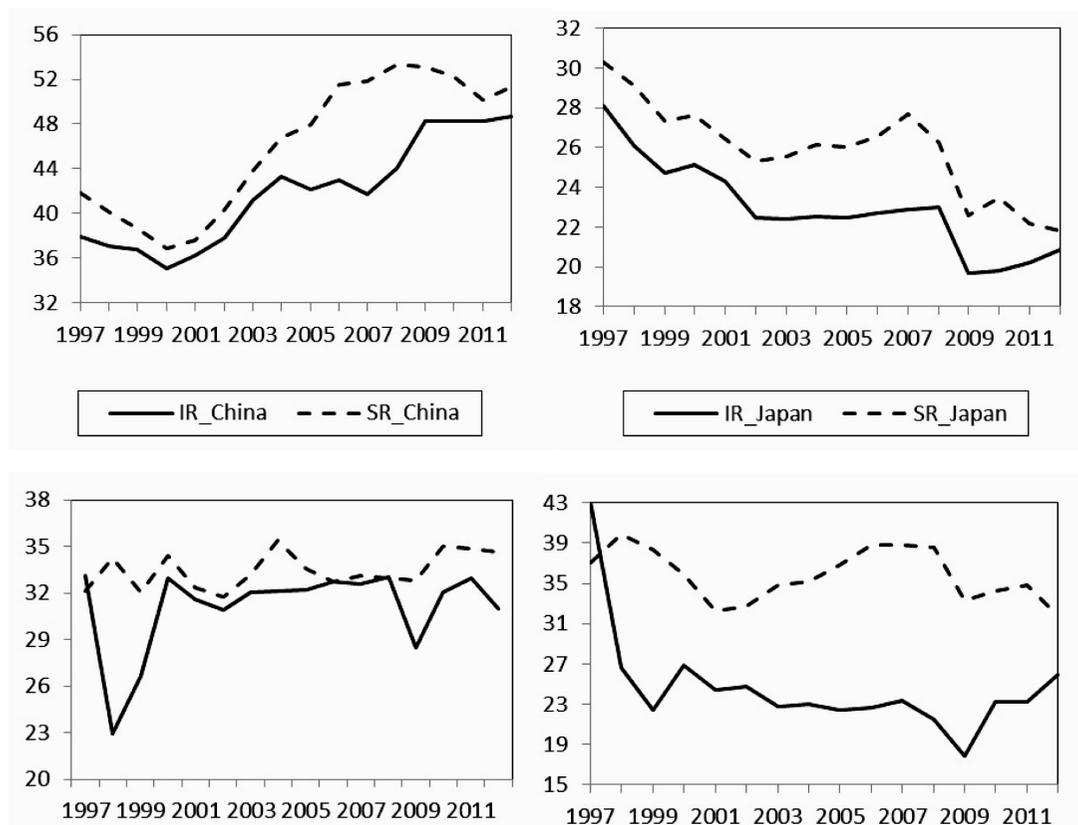
Table 1 Investment and Saving Rates (in percent of GDP)

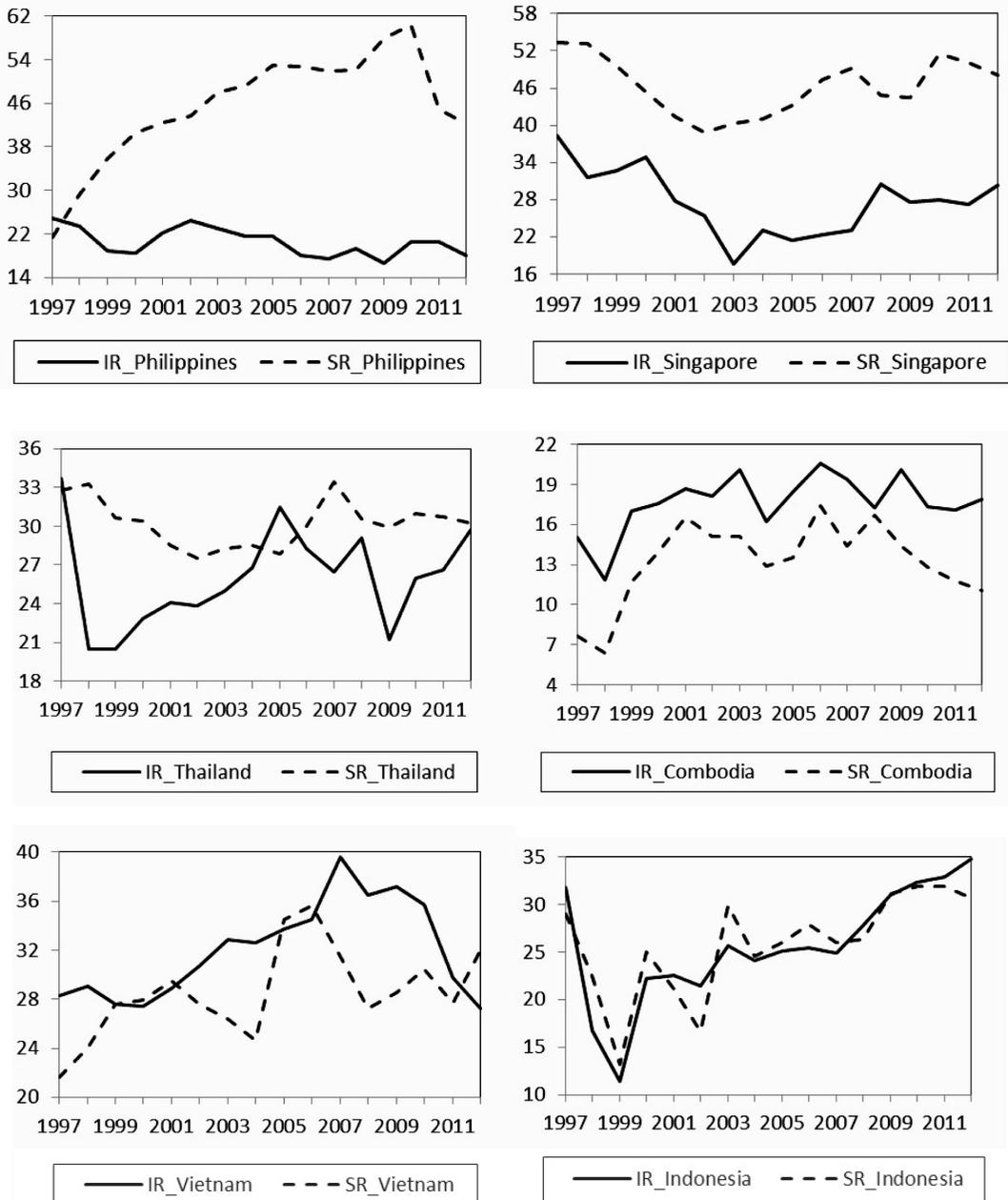
Countries	Investment Rate			Saving Rate		
	mean	maximum	minimum	mean	maximum	minimum
China	0.4609	0.5335	0.3683	0.4186	0.4866	0.3512
Japan	0.2295	0.2809	0.1967	0.2589	0.3030	0.2182
South Korea	0.3108	0.3313	0.2294	0.3345	0.3542	0.3177
Malaysia	0.3582	0.3985	0.3173	0.2463	0.4297	0.1784
Philippines	0.2054	0.2478	0.1659	0.4533	0.4637	0.2143
Singapore	0.2761	0.3820	0.1764	0.4636	0.5344	0.3881
Thailand	0.3022	0.3343	0.2751	0.2600	0.3366	0.2045
Vietnam	0.2856	0.2783	0.2162	0.3198	0.3165	0.2724
Indonesia	0.2562	0.3474	0.1137	0.2586	0.3189	0.1320
Cambodia	0.1766	0.2055	0.1183	0.1321	0.1741	0.1741

Figure 1 shows the trend of investment and savings rates of each country. Except for the Philippines, all the countries show the same trend for both rates. For China, both the investment and savings rates dramatically and steadily increase since 1997. However, for

Japan, both the rates drop down quickly during this period. For South Korea, Singapore, and Cambodia, the variations in the two ratios are small. However, for the Philippines, Thailand, Vietnam, and Indonesia, both the rates jump up and down within a short time.

Figure 1 Investment (IR) and saving (SR) rates (percent of GDP)





Source: World Bank, World Development Indicators.

2. Panel root unit result

Table 2 and Table 3 show the panel unit root test results for investment and saving rates. This study presents four types of panel unit root tests, as suggested by Levin et al. (2002), Im et al. (2003), Choi (2001), and Maddala and Wu (1999), to ensure robust results. Because we

divide our dataset into four groups and run the panel regression model for each group data, we need to do the panel unit root test too for each group data. From Table 2 and Table 3, all the empirical results reject the hypothesis of unit root at the 1% or 5% significance level. Therefore, the time series data for

Table 2 Panel Unit Root Test Results for Investment Rate

Method	Investment Rate			
	All countries	Without China	Without Japan	Without C&J
Levin	-2.3783*** (0.0087)	-2.6233*** (0.0044)	-2.5527*** (0.0053)	-2.3371*** (0.0097)
Im,Pesaran	-2.3317*** (0.0099)	-2.0107** (0.0222)	-2.2682** (0.0117)	-1.9315** (0.0267)
ADF-Fisher	42.2755*** (0.0025)	37.0141*** (0.0052)	39.3554*** (0.0026)	34.0940*** (0.0053)
PP-fisher	63.6837*** (0.0000)	57.5575*** (0.0000)	60.3005*** (0.0000)	54.1742*** (0.0000)
Observation	160	144	144	128

Indicates significance at the 5% level; * indicates significance at the 1% level.

Table 3 Panel Unit Root Test Results for Savings Rate

Method	Saving Rate			
	All countries	Without China	Without Japan	Without C&J
Levin	-3.9777*** (0.0000)	-4.4981*** (0.0000)	-4.0996*** (0.0000)	-4.6684*** (0.0000)
Im,Pesaran	-2.4266*** (0.0076)	-2.4752*** (0.0067)	-2.6043*** (0.0046)	-2.6746*** (0.0037)
ADF-Fisher	39.9126*** (0.0051)	37.8276*** (0.0041)	38.6751*** (0.0031)	36.5901*** (0.0024)
PP-fisher	33.7110*** (0.0281)	32.7031** (0.0181)	32.3786** (0.0198)	31.3708** (0.0121)
Observation	160	144	144	128

Indicates significance at the 5% level; * indicates significance at the 1% level.

both investment and savings rates are stationary. We run the regression on the panel model in the next section.

3. Regression results

We estimate the fixed effect panel data model, random effect panel data model, and pooling data model for the four groups. We choose the three types of estimation models to obtain robust results by each model. The empirical results are shown in Table 4. For the sample of Asian countries, coefficient β for the fixed effect panel data model is about 0.3165 and the t-statistic is 4.3216. This result indicates that for a 1%-rise in the savings rate increases, the investment rate increases by 0.3165%. For the random effect panel data and pooling data models, coefficient β takes values

0.3161 and 0.3134, respectively, both of which are quite close to 0.3165.

Furthermore, if we drop China from the sample, the estimated coefficient β is about 0.2449 for the fixed effect model. This is smaller than the estimation of β for all the Asian countries. This means that China cannot cooperate well enough with the Asian countries in financial integration. Empirical results for the random effect panel data and pooling data models also prove the coefficient β for the sample without China to be significantly smaller than that for the sample of all Asian countries. This finding supports the conclusion that China does hinder the financial integration of Asia.

When we estimate the sample without Japan, we find a similar conclusion that Japan too

Table 4 Regression Results

	β	t-Statistic
All countries		
Fixed effect	0.3165***	4.3216
Random effect	0.3161***	4.6870
Pooling	0.3134***	9.2297
Without China		
Fixed effect	0.2449***	3.3017
Random effect	0.2254***	2.9320
Pooling	0.1484***	2.8776
Without Japan		
Fixed effect	0.3019***	3.9742
Random effect	0.3016***	4.2761
Pooling	0.2988***	8.0364
Without China & Japan		
Fixed effect	0.2253***	2.9081
Random effect	0.2350***	3.3237
Pooling	0.2253***	2.9081

*** Indicates significance at the 1% level.

hinders the financial integration of Asia. However, Japan does not hinder the financial integration too much, because the coefficient β for the sample without Japan is significantly around 0.30, which is quite close to 0.31, the coefficient for the sample of all Asian countries.

Finally, the empirical results for the sample without China and Japan further indicate the same conclusion that both China and Japan do really hinder the financial integration of Asia. The coefficient β for the sample without China and Japan is 0.2253 for the fixed effect model. In addition, the results of the random effect panel data and pooling data models are also around 0.22, and all the estimations are significant at the 1% level.

Some explanations are offered for our empirical findings. First, China implements strict foreign exchange controls and all foreign financial capital flows are regulated by the Chinese government. Only a Qualified Foreign Investment Institution (QFII) can gain some foreign exchange quota to invest in China's financial market. On the other hand, when China's local financial institutions want to

invest in the foreign financial market, only a Qualified Domestic Investment Institution (QDII) can obtain the foreign exchange quota to invest. Second, the Asian leaders, China and Japan, may not cooperate well and may hinder the financial integration of Asia.

V. Summary and Conclusions

This study examines whether China and Japan actually hinder the financial integration of Asia from 1997 to 2012. We find that both China and Japan do not cooperate well enough with other Asian countries and that they actually hinder the financial integration of Asia. Our findings provide at least two policy implications for China and Japan. First, China should loosen its control on foreign capital flows gradually and cooperate with the other Asian countries more. Second, as the leading countries of Asia, China and Japan should set their prejudices aside and cooperate more with the other Asian countries in all economic and financial matters.

Notes

- 1) The main Asian countries include China, Japan, South Korea, Malaysia, the Philippines, Singapore, Thailand, Cambodia, and Vietnam.

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