Cross-listings and Financial Integration in Asia

Tony Cavoli, Ron McIver and John Nowland

Recent literature suggests the extent of foreign listings (cross-listings) on domestic stock exchanges may be informative as a measure of financial integration. In this study, we present both stylized facts and panel data analysis examining relationships between the proportion of foreign listings and other measures of integration in a sample of Asian markets to determine if this form of cross-listing complements or substitutes for other aspects of integration. We find that higher trade openness, higher output growth and lower inflation are associated with a greater proportion of foreign listings. In addition, we find that FDI openness has a negative relationship to the proportion of foreign listings, suggesting that these aspects of financial integration are substitutes. For policymakers, our results indicate that unless the appropriate financial liberalisation policies are in place, countries may find it difficult to simultaneously attract foreign listings to enhance development of their stock market and to grow their real economy through FDI.

Keywords: Integration, financial integration, foreign listings, cross-listings.

I. Introduction

An assessment of the stylized facts and recent literature around stock market cross-listings suggest that the extent to which foreign listings are present on domestic exchanges may be informative as a measure of the degree of financial integration in particular and economic integration more generally.[1] We know from the literature on integration that no single measure can possibly capture all of the salient characteristics of integration. Thus we observe a range of measures based on: macroeconomic characteristics (for example, the Feldstein-Horioka savings/invest-ment relationship and consumption correlations); price and arbitrage conditions (for example, equity return correlations, uncovered interest parity and purchasing power parity); and quantities of flows (including trade openness and trade and capital flow intensities). Other measures rely on con-structing indices of trade or capital account restrictions and political economy considerations, such as trade agreements and investment accords.[2]

This paper presents analysis of the relationship between cross-listings and the extent of economic and financial integration, paying particular attention to Asian countries. We analyse this

relationship in two ways. First, we present stylized facts to compare levels of foreign listings against other conventional measures of economic and financial integration to determine if cross-listings provide any additional information about the predominant characteristics of integration. Second, we undertake panel analysis of the determinants of foreign listings to examine whether other measures of integration encourage or, in fact, crowd out foreign listings.

The policy implications of research of this type are multifaceted. As mentioned above, foreign listings may provide information about the nature of economic integration that other measures are unable to pick up. Furthermore, an ongoing debate in the literature on monetary policy and international finance in Asia is the plausibility of monetary integration in the region and whether Asia — or parts thereof — might form an optimal currency area (OCA). OCAs depend crucially on the extent of openness, or integration, of the possible member countries. As such, a study that further informs the integration landscape will prove useful. A third policy implication of this work relates to how foreign listings interact with other variables measuring openness or integration. Do they augment other activities, leading to greater integration, or might they be an impediment such that they "crowd out" integration through trade and other investment channels?

While not dealt with explicitly in this paper, an important set of final questions are: What implications are there for the role of trade and/or financial liberalization policies, especially regarding the sequencing of such policies? Does cross-listing lead or lag any possible liberalization activities? Will liberalization policy encourage or deter future cross-listing?

This paper is organized as follows: The next section outlines some of the pertinent and recent literature on foreign listings and their connection with integration. Section III presents some evidence on the relationship between cross-listings and integration by way of stylized facts — paying special attention to a selection of Asian economies. Section IV presents panel data analysis of

the determinants of cross-listing and provides a discussion of the main results, especially as they relate to Asia. Section V concludes.

II. Cross-listings and Integration

Prior research on cross-listings has identified a number of reasons why firms choose to cross-list their shares on foreign exchanges. The earliest literature focuses on cross-listing as a vehicle for firms from segmented markets to overcome regulatory restrictions. By cross-listing their shares on foreign markets, firms can gain access to new sources of capital and expand their investor base to include potential investors who are restricted from investing in the segmented market (Karolyi 1998). Subsequent literature has also included the bonding hypothesis as another motivation for firms to cross-list. The bonding hypothesis suggests that firms choose to cross-list on high-quality foreign exchanges to signal to the market that they are committed to better investor protection (Coffee 1999; Stulz 1999). A review by Karolyi (2006) also highlights other benefits associated with cross-listing, such as increased visibility and exposure in the cross-listed market and an improved ability to attract local managerial talent and pursue opportunities in the local mergers and acquisitions market.

A number of studies have quantified the benefits of cross-listing to individual firms. Doidge, Karolyi, and Stulz (2004) show that cross-listed firms are on average valued 16.5 per cent higher than their non-cross-listed counter-parts. Bris Cantale and Nishiotis (2007) quantify the segmentation, bonding and liquidity impacts on stock prices to determine the economic significance of each effect. While both the market segmentation and bonding effects are found to be statistically significant, segmentation has more than double the economic significance of bonding. Cross-listing is also found to have a statistically significant impact on liquidity for both the domestic and foreign listings of the stock. Hail and Leuz (2009) also show that cross-listed firms have a lower cost of capital. Reese and Weisbach

(2002) show that cross-listing is associated with future increases in capital raisings, relative to those that would occur in the absence of cross-listing. In addition, Lang, Lim, and Miller (2003) and Wojcik, Clark, and Bauer (2005) show that cross-listed firms have better accounting quality and higher corporate governance ratings.

As outlined above, the cross-listing literature has been nested predominantly in the fields of finance or international business, with studies examining the motivations and benefits of cross-listing for individual firms. Few studies have examined the effect of push and pull factors, which are prevalent in the literature on the flow of capital into countries. A notable exception is Sarkissian and Schill (2009) who examine the effect of relative market characteristics, such as market size, trade openness, culture and tax, on the benefits of cross-listing to firms. Similarly, Halling et al. (2008) examine the effect of country characteristics on the split of trading between home and cross-listed markets. Based on the bonding hypothesis, other studies have also examined differences in investor protection between the home and host markets (for example, Doidge, Karolyi and Stulz 2004).

In this study, our focus is on whether the extent of foreign listings in a host market is informative about the integration of that market with other economies. It thus reflects ideas raised in Hargis (2000), regarding the potential role of cross-listings in raising market liquidity and market capitalization as part of a process of greater integration and financial development. This brings the analysis of cross-listings to the country level, rather than the more traditional focus on individual firms. Recent contributions including those of Claessens and Schmuckler (2007) and Gozzi, Levine and Schmuckler (2010) have examined foreign listings as a way of providing insights into the extent of integration — although primarily financial integration. Both Claessens and Schmuckler (2007) and Gozzi, Levine and Schmuckler (2010) examine patterns of cross-listing around the world and likely determinants. However, their focus stays at the firm level, and

only examines push factors from the home market. Thus they do not consider cross-listings as a measure of integration of the host market.

## III. Cross-listing: Some Stylised Facts

This section presents basic empirical evidence on the extent of foreign listings on stock exchanges in Asia and how these compare with some measures of the extent of trade and capital openness for countries in the region.

Figure 1 presents a graph of foreign listings as a proportion of total listings in our sample of Asian stock markets for the period 2000–09. The second panel of this figure shows the results for Singapore separately, owing to the significantly higher proportion of cross-listings on that country's stock market. It is interesting to note that the stock markets of Japan and Hong Kong both exhibited a relatively high proportion of foreign listings before falling in recent times. In contrast, those of Taiwan, South Korea and Malaysia have recently jumped markedly. Figure 2 shows the proportion of foreign listings to total listings by region. Despite the higher proportion of foreign listings in Singapore and strong growth in foreign listings since the mid 2000s, the Asian region continues to have a considerably lower proportion of foreign listings than that of the more developed markets in North America and Europe.

Figure 3 presents the trade openness levels for our sample of Asian economies for 2000–09 (with some additional countries being added for comparison purposes). As with foreign listings, Singapore (along with Hong Kong) exhibits higher levels of trade openness. Figure 4 shows that as a region, Asia has a high openness to trade but this is most likely due to the very high levels for Singapore and Hong Kong.
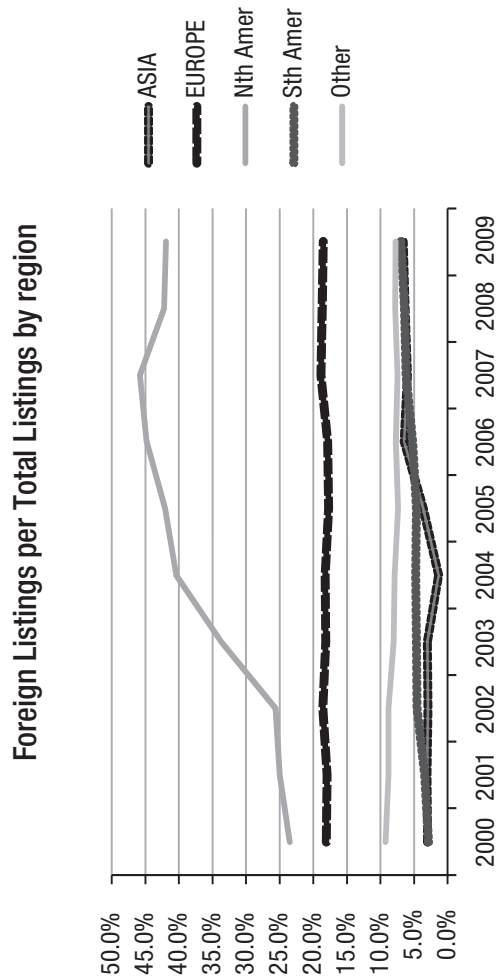
A similar pattern emerges for FDI openness of Asian countries in Figure 5, where the levels of openness for Hong Kong and Singapore are clearly higher than those of the remainder of countries sampled. Figure 6 shows that Asia's openness to FDI is also quite high relative to all other regions, except Europe.

FIGURE 1

Foreign Listings as Percentage of Total Listings for Asian Sample, 2000–2009
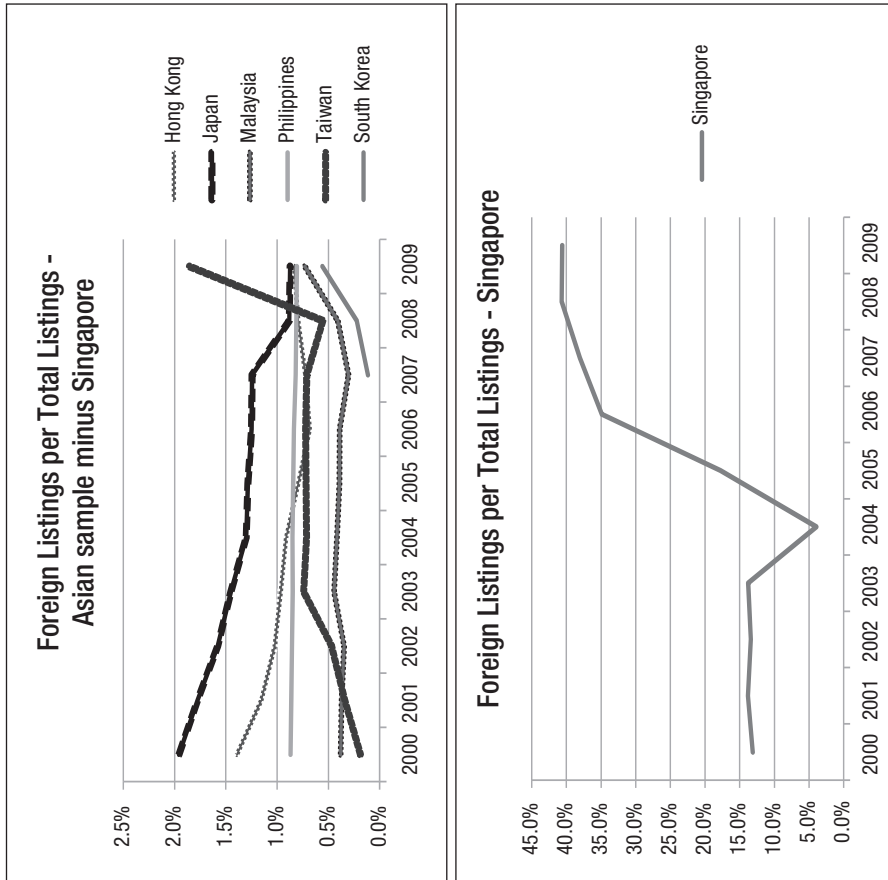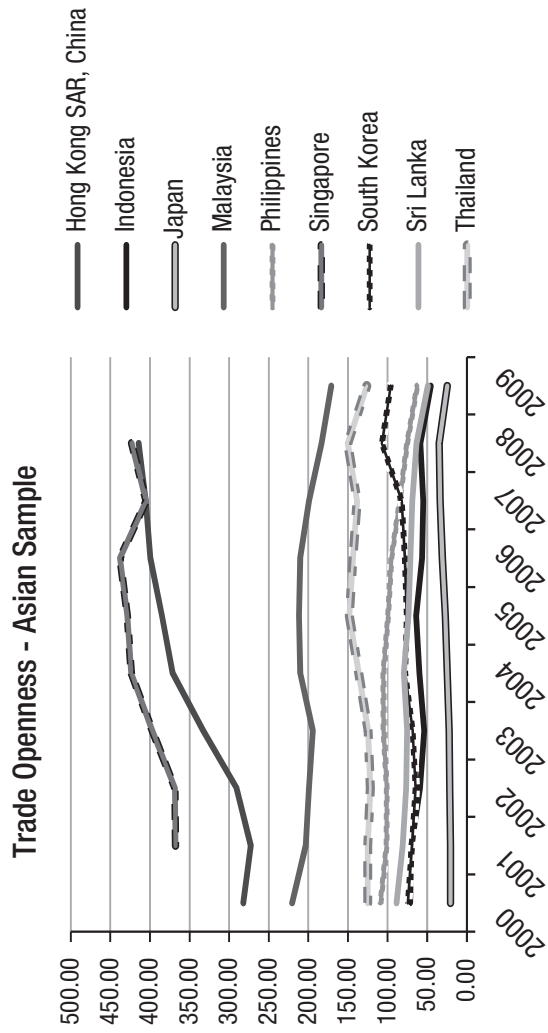

Foreign Listings per Total Listings - Asian sample minus Singapore

Foreign Listings per Total Listings - Singapore

FIGURE 2
Foreign Listings as Percentage of Total Listings by Region, 2000–2009

**Foreign Listings per Total Listings by region**

SOURCE: World Federation of Exchanges.
<www.world-exchanges.org/statistics/annual/2009/equity-markets/number-listed-companies>.

FIGURE 3
Trade Openness ([Imports + Exports]/GDP) for Asia, 2000–2009

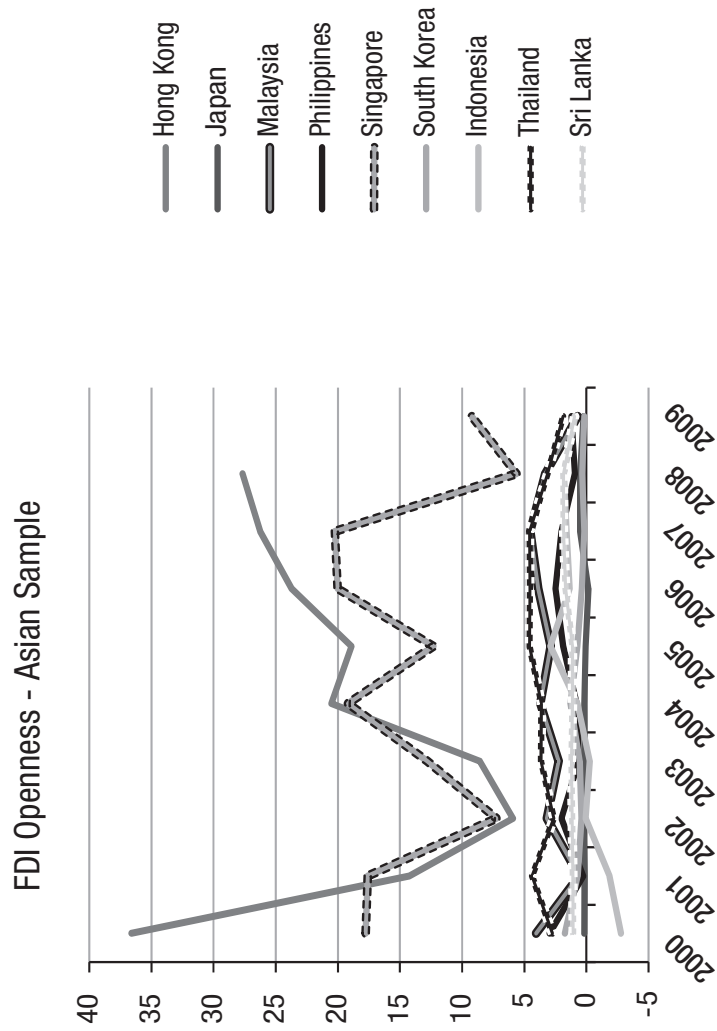**Trade Openness - Asian Sample**

Legend: Hong Kong SAR, China; Indonesia; Japan; Malaysia; Philippines; Singapore; South Korea; Sri Lanka; Thailand

SOURCE: World Development Indicators.
<http://data.worldbank.org/data-catalog/world-development-indicators>.

FIGURE 4

Trade Openness ([Imports + Exports]/GDP) by Region, 2000–2009

Trade Openness - Averages per Region

ASIA
EUROPE
North America
South America
Other
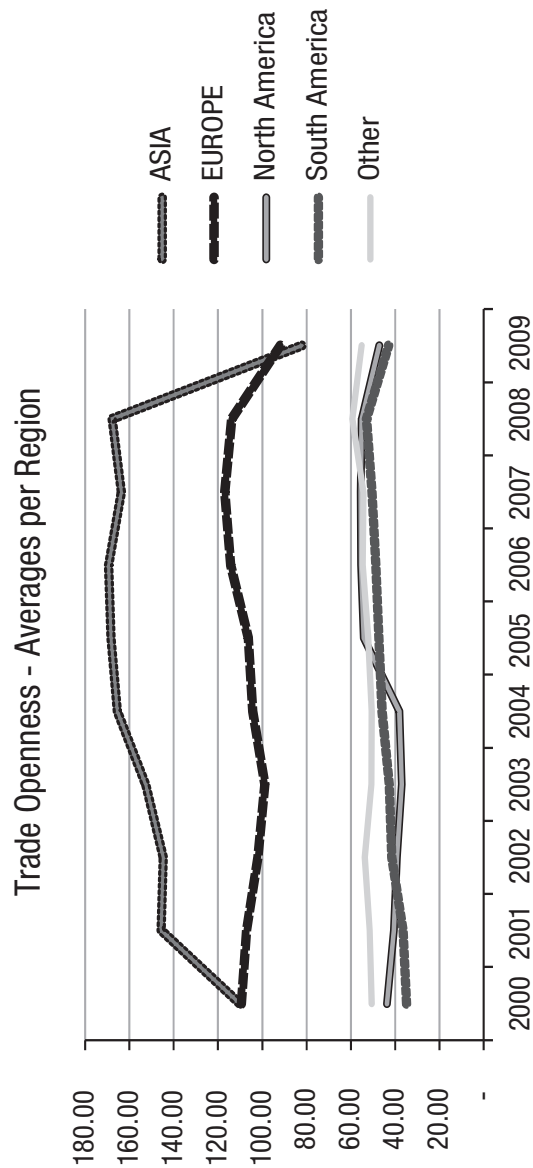
SOURCE: World Development Indicators.
<http://data.worldbank.org/data-catalog/world-development-indicators>.

FIGURE 5
FDI Openness (Inward FDI/GDP) for Asia, 2000–2009

FDI Openness - Asian Sample

Legend: Hong Kong, Japan, Malaysia, Philippines, Singapore, South Korea, Indonesia, Thailand, Sri Lanka

SOURCE: World Development Indicators.
<http://data.worldbank.org/data-catalog/world-development-indicators>.

FIGURE 6
FDI Openness (Inward FDI/GDP) by Region, 2000–2009

Averages per Region
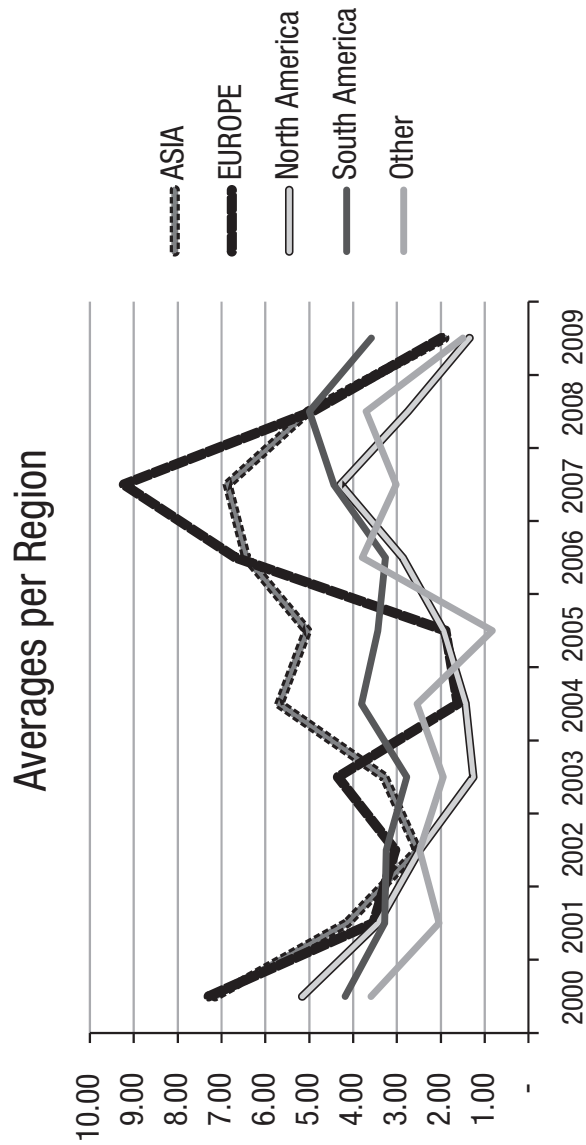
Figure 7 presents the Chinn-Ito index (Chinn and Ito 2008) of capital mobility for our sample of Asian economies for 2000–09. The more mature financial markets of Singapore, Hong Kong and Japan are the most open. In global terms, Figure 8 shows that the European and North American regions are the most open, with Asia being nestled in with the other regions.

We conclude from the data presented in this section that foreign listings do track other measures of integration within the Asian region. The more developed markets, Hong Kong and Singapore in particular, are the most open and also seem to have a greater proportion of foreign listings. This is mirrored when one compares regions, from which it is inferred that the more mature markets of the European and North American regions attract greater foreign listings.

IV. Determinants of Cross-listing: Panel Least Squares Estimates

In this section, panel regressions are employed for our sample of Asian markets to ascertain the determinants of cross-listing. In keeping with our theme of linking integration with foreign listings, our interest is in whether trade and financial integration help or hinder cross-listing. Additionally, we seek to find whether we can identify any significant push or pull factors that may promote foreign listings. The data employed essentially match that from the economics literature on the determinants of capital flows. As such, measures including output growth, inflation, interest rates, as well as market capitalisation and the top corporate tax rate are used for countries in the sample.

IV.1 Data Description

The sample consists of annual observations from 2000–09 for eight countries, namely: Hong Kong, Japan, Korea, Malaysia, the Philippines, Singapore, Sri Lanka and Taiwan. The data for foreign listings as a percentage of total listings is taken from the *World Federation of Exchanges*.[3]

The data for trade openness, FDI openness, output, inflation, market capitalisation and the top corporate tax rate are all taken from the World Bank *World Development Indicators* database.[4] Interest rate data is taken from the IMF's *International Finance Statistics (IFS)* database. For Taiwan, we source interest rate, output, inflation, trade openness and FDI openness data from Asian Development Bank databases.[5]

IV.2 Model and Estimates

The basic model is specified as follows:

$$FL_{it} = \alpha + \beta_1 TR_{it} + \beta_2 FD_{it} + \gamma X_{it} + \varepsilon_{it} \qquad (1)$$

FL_{it} is the first difference of the proportion of foreign listings to total listings for country i in year t.[6] TR_{it} (FD_{it}) is the level of trade openness (FDI openness) for country i at time t. Trade openness is defined as imports plus exports for each country divided by its GDP, FDI openness is defined as the flow of inward FDI scaled by GDP. X_{it} is a vector of controls that may influence the extent of foreign listings and includes inflation, output interest rates,[7] market capitalization, the Chinn-Ito Index and the corporate tax rate.

Our empirical strategy is as follows: we employ panel data OLS tests of the above equation and estimate the model with no fixed effects, and then with a two-way fixed effects model. We also tested using a one-way fixed-effects (cross-section) model and include a global financial crisis dummy.[8] The dummy was removed for the two-way model, since it would be perfectly correlated with some of the time-related fixed effects. We are mindful that the Chinn-Ito index and the tax variable do not exhibit much time series variation and the effects of such variables might usually be absorbed by the fixed-effects terms in the subsequent tests.

IV.3 Results

Table 1 presents the results for the model specified above, and several observations can be made.
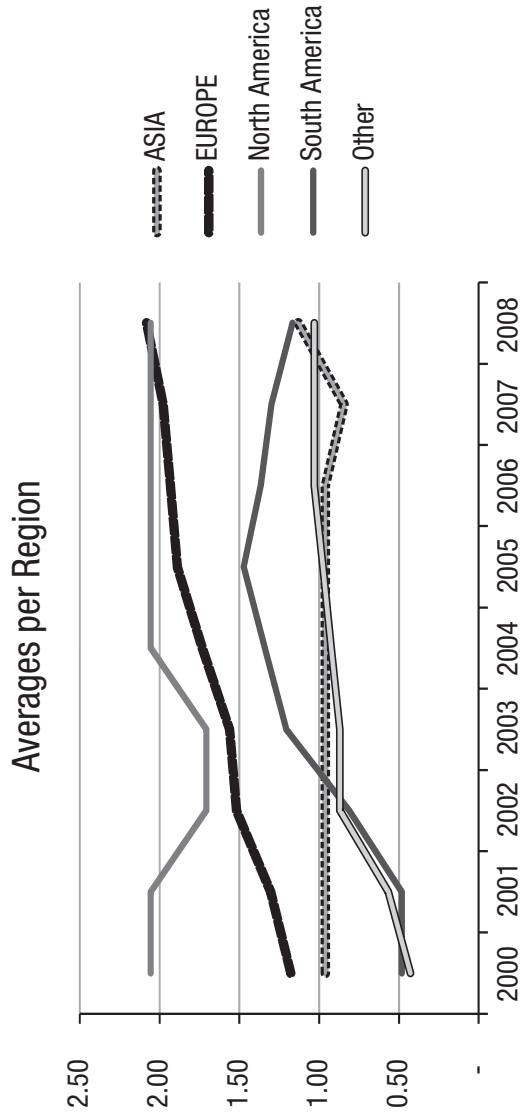
Chinn-Ito Index of Capital Account Openness - Average 2000–2008
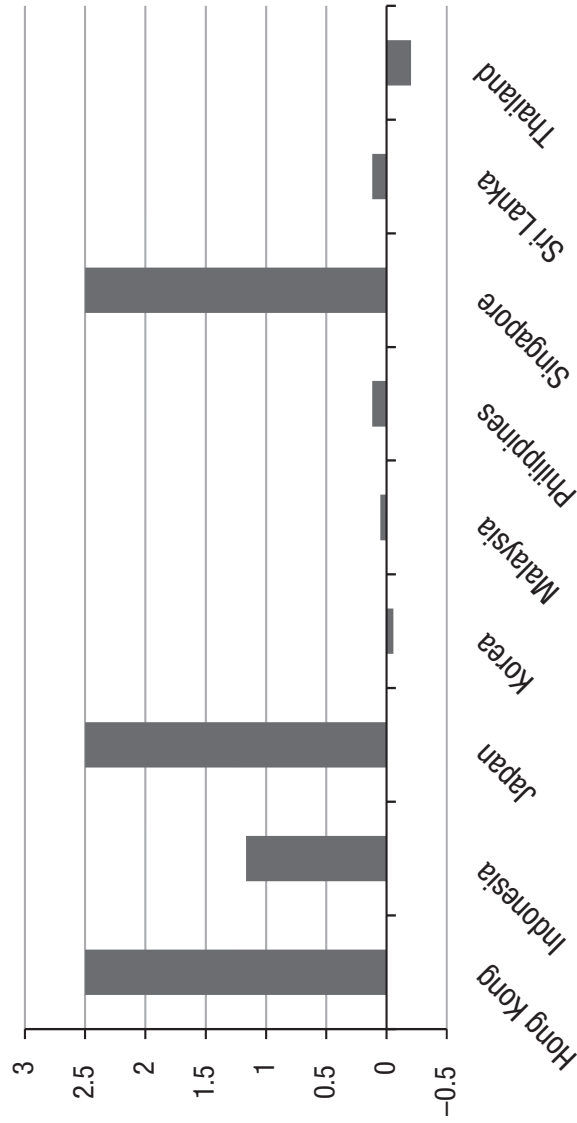
SOURCE: Chinn and Ito (2008).

FIGURE 8
Chinn/Ito Index of Capital Mobility by Region, 2000–2009

Averages per Region

SOURCE: Chinn and Ito (2008).

TABLE 1

Panel Least Squares Results for Asian Sample

Dependent Variable: FL_{it}

	No Fixed effects				One way (country) Fixed Effects				Two Way Fixed Effects			
Const	-0.34	-0.45	-0.99	**-2.12**	-3.75	-7.25	**-8.49**	**-11.51**	-3.50	-6.65	**-10.88**	**-10.27**
	(0.54)	(0.46)	(0.26)	**(0.05)**	(0.25)	(0.11)	**(0.06)**	**(0.02)**	(0.34)	(0.19)	**(0.03)**	**(0.06)**
TR_{it}	**0.04**	0.01	0.01	0.003	0.03	**0.06**	0.05	**0.07**	0.03	0.05	**0.06**	**0.06**
	(0.08)	(0.12)	(0.23)	(0.51)	(0.20)	**(0.09)**	(0.11)	**(0.05)**	(0.28)	(0.15)	**(0.07)**	**(0.09)**
FD_{it}	-0.04	-0.17	-0.08	-0.09		-0.22	**-0.35**	**-0.37**		-0.22	**-0.43**	-0.35
	(0.60)	(0.40)	(0.34)	(0.29)		(0.24)	**(0.08)**	**(0.07)**		(0.28)	**(0.04)**	(0.11)
Y_{it}		0.23	0.28	**0.56**			**0.52**	**0.61**			**0.82**	**0.75**
		(0.13)	(0.12)	**(0.02)**			**(0.06)**	**(0.04)**			**(0.01)**	**(0.04)**
$Infl_{it}$			-0.18	**-0.42**				-0.60				-0.59
			(0.41)	**(0.10)**				(0.06)				(0.17)
IR_{it}			0.06	0.17				0.26				0.23
			(0.74)	(0.34)				(0.19)				(0.31)
GFC				**2.93**	0.05	0.04	1.83	**3.52**				
				(0.08)	(0.96)	(0.96)	(0.20)	**(0.06)**				
Adj R-sq	0.08	0.07	0.09	0.11	0.04	0.03	0.09	0.12	0.04	0.02	0.16	0.15
Obs	62	58	56	56	62	58	58	56	62	58	58	56

NOTE: Figures in parentheses are probabilities. Figures in bold are significant at the 10 per cent level. The sample includes the following countries: Hong Kong, Japan, Korea, Malaysia, the Philippines, Singapore, Sri Lanka and Taiwan for the years 2000–2009. A one-period lagged dependent variable is also included in all specifications but is not reported. The reason for its inclusion is that it absorbs any possible serial correlation that may be present and potentially inducing bias in the existing parameter values. For the most part, the lagged dependent variable term is statistically significant. The DW statistic is not reported but returns a value of between around 2.05 and 2.50 for all estimates.

In general terms, and given that we are examining the possible integration properties of foreign listings, much of the variation in the dependent variable is not being explained in the model. This is expected, given the range of possible explanations that emanate from the finance literature on what might determine cross-listings. That said, however, the individual coefficients present some interesting and reportable results.

The first result is that trade openness, TR_{it}, is positive (but small in magnitude), statistically significant in many instances, and only marginally insignificant in several more. Hence, a more open real economy will also be one that attracts more foreign listings. This is intuitive as a possible reason for listing could be to raise capital to increase production with a view to accessing export markets.

The second finding is that the impact of inward FDI openness (FD_{it}) on foreign listings is negative. Statistical significance is mixed, with the most persuasive results occurring when we allow for one- and two-way fixed effects in the estimations. While the negative value for the FDI coefficient may appear unexpected at first, it is quite plausible. This involves consideration of inward FDI and foreign listings as substitutes. Net inflows of FDI suggest a shortage of local capital. Thus, we conjecture here that it may be that higher levels of FDI will be associated with lower levels of foreign listings (i.e. FDI in a sense has crowded out cross-listings). This would be reinforced by the costs of listing (in terms of compliance and reporting) being high and if authorities have promoted capital account liberalization through FDI.

Of our controls, output growth, Y_{it}, is positive and quite robustly significant across the models. Again, this result is intuitive as countries that are richer and (potentially) more developed will attract greater foreign listings. Inflation ($Infl_{it}$) is negative as it presents a disincentive to list (given the potential for currency depreciation and the erosion of real returns) but the results are not sufficiently significant to warrant strong conclusions here. Curiously, interest rates (IR_{it}) are not significant and market capitalization and

corporate tax rates were not statistically significant and so are omitted from the results presented. The global crisis dummy returned a positive value, suggesting that foreign listings increased during the crisis period. While somewhat counter-intuitive, it can be explained by Figure 1 which shows that foreign listings for Taiwan, Korea and, to a lesser extent Malaysia, increased notably during that period and thus may be influencing the results.

V. Conclusions and Policy Implications

This paper examines relationships between foreign cross-listings and other measures of integration, particularly financial integration, in a sample of Asian economies. Thus, it makes a contribution by bridging a number of areas of the literature: cross-listings, which have largely been captured in the finance and international business literature; and integration, which has largely been the preserve of the international trade and economics literature. It does so by presenting both stylized facts about the level of foreign listings in Asia and through panel data analysis of the relationship between foreign listings and other key measures of integration.

In terms of the stylized facts presented in the paper, we find that foreign listings track other measures of integration within the Asian region reasonably well. More developed markets within Asia are the most open and have a greater proportion of foreign listings. This result is consistent when we compare regions, with the more mature regions of Europe and North America also attracting greater foreign listings.

In our panel data analysis of the determinants of foreign listings, we present a number of findings, some of which are expected and others which may at first seem surprising. First, we find that trade openness generally has a positive but small effect on foreign listings — that is, a more open real economy attracts more foreign listings. Second, and perhaps more controversial, is that inward FDI openness appears to be negatively associated with foreign listings. We argue that inward FDI and foreign listings are, in a broad sense, substitutes. Net inflows of FDI suggest a shortage of local

capital and thus higher levels of FDI 'crowd out' cross-listing (the shortage of local capital is not conducive to foreign firms listing in the country). Third, we find that output growth has a positive impact on foreign listings and inflation has a negative impact (although statistical significance is a concern) due to incentive effects. Fourth, we find that interest rates, market capitalization and corporate tax rates are not significantly related to foreign listings. Fifth, we find that the global crisis had a positive impact on foreign listings, which is likely due to increased foreign listings in Taiwan, Korea and Malaysia during this period — a result of the sample of countries selected. Finally, we find that the standard measures used in the integration literature provide relatively limited statistical explanation of variation in foreign listings. This may reflect the relatively small size of our sample, suggesting that future studies need to be based on an expanded panel data set.

In light of the above, our policy conclusions are tentative and for this reason, limited. This reflects both the size of the panel data set and the preliminary nature of this study. We suggest that countries that are seeking to encourage increased liquidity in their equity markets (and other measures of financial development) be mindful of their reliance on FDI. Those countries highly dependent on net inflows of FDI need to recognize that resources diverted into directly encouraging cross-listings within their domestic equity market (for example, marketing, concessions on registration, etc.) may be less effective than if expended on alternative policy developments. This is due to the presence of possible crowding out between foreign listings and FDI, based on the negative relationship that we have observed between FDI and foreign listings. The analysis would appear to suggest that resources may be better applied to ensuring that the real economy is opened by encouraging trade integration, and that establishing a positive macroeconomic environment also be a focus (strong growth and low inflation to encourage growth in internal funding for investment), each of which is conducive to foreign listings.

NOTES

1. We use the terms cross-listings and foreign listings interchangeably in this paper — reflecting that we are using foreign listings in the destination markets as a measure for cross-listings, not capturing the source.
2. There are many surveys on these issues — for instance see Cavoli and Rajan (2009), Takagi and Hirose (2001).
3. <www.world-exchanges.org/statistics/annual/2009/equity-markets/number-listed-companies>.
4. <http://data.worldbank.org/data-catalog/world-development-indicators>.
5. <www.adb.org>.
6. Using the first difference essentially makes the dependent variable a flow variable, offering us comparability to the other integration variables, TR_{it} and FD_{it}.
7. Interest rate data is mainly money market rates from IFS (Line 60B). For Taiwan the 6-month time deposit rate is taken from the ADB databases.
8. The crisis dummy returned zeros for all years except for 2008 and 2009.

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