Are FDI Inflows Complements or Substitutes Across Borders: Empirical Evidence from Five Asian Countries

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Abstract

The inflow of foreign direct investment (FDI) in Asian countries increased rapidly during the 1980s and 1990s, and a vast literature has found a positive association between FDI inflows and growth for developing countries, noting a series of threshold effects. Less attention has been paid in the literature to whether developing countries are competing or complementing each other in ongoing efforts to stimulate FDI inflows. In this paper we therefore study the causality between growth and FDI in a sample of five Asian countries and uncover the co-movements of FDI shares in the region using a vector autoregressive (VAR) model. It emerges clearly that Granger causality exists from growth to FDI, and FDI flows are indeed strongly interrelated in the Asian region. Significant policy relevant differences among individual countries in our sample and the rest of Asia are also revealed.

Key words: Foreign direct investment, Asia, causality
JEL classification: F21, O53, C50

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1. Introduction

Foreign direct investment (FDI) has been a defining feature of the world economy and globalization over the past couple of decades, and concerted efforts are pursued by many developing countries to promote increased FDI. However, FDI remains highly concentrated. This is so both with reference to developed countries and as regards flows to developing countries. The African continent is lagging behind Latin America and Asia, and FDI is particularly important in Asian countries where this foreign resource flow is the most important source of external financing, and growth in FDI has been substantial.

Figure 1 shows three measures of the total inflow of foreign direct investment to Asia. There is a fairly constant rate of growth in nominal USD FDI-flows to Asia with an average annual growth rate of 19%.[2] Moreover, the two constant price series in Figure 1, where nominal flows have been deflated with respectively a World price index and an East-Asian price index, also show a constant growth trend during the period 1970-2000. Average annual growth rates of respectively 8.6 and 10 % can be noted. Accordingly, FDI-flows to Asia have more than tripled during the period under study.

[Figure 1 about here]

In most Asian countries, FDI inflows have also been substantial as measured in relation to the size of their economies. In this paper we focus on the following five countries: China, Indonesia, Malaysia, Vietnam and Thailand. The stock of FDI to GDP in China (31%) is close to the average for all Asia, whereas Indonesia (46%), Malaysia (65%), and Vietnam (56%) have FDI/GDP ratios which far exceed both Asian and world standards. Thailand, on the other hand, has a relatively low FDI stock as a share of GDP. Thailand nevertheless ranks 12th among developing country recipients of total inward FDI stock.

There is in the development literature a long and contentious debate about the costs and benefits of FDI inflows to recipient countries. On the one hand, evidence exists to confirm that given appropriate policies and a basic level of development, FDI can play a key role in triggering technology spillovers, assist human capital formation, contribute

[2] There is no natural choice of deflator for FDI-flows to a region. We have therefore chosen to report two (approximate) measures of constant USD flows. In one we have deflated nominal values using the World average consumer price index and in the other we deflate by average East Asian consumer prices. Both series are from the WDI CD-ROM 2002. FDI measures (flows and stocks) are from the UNCTAD FDI data base available at http://r0.unctad.org/en/subsites/dite/fdistats_files/fdistats.htm.

to international trade integration, and help create a better business environment. On the other hand, potential drawbacks include a deterioration of the balance of payments as profits are repatriated, lack of linkages with local communities, potential harmful environmental consequences, social disruptions and negative impacts on competition in national markets. On balance, the consensus view on FDI seems to be that there is a positive association between FDI inflows and developing country growth provided receiving countries have reached a minimum level of educational, technological and/or infrastructure development. There is however less clarity about causality, which is crucial for the formulation of economic policy.

In this paper, we therefore study the short run causal pattern between economic growth and FDI in the five selected Asian countries. Based on panel data for the period 1970-2000, we show that growth in general Granger-causes FDI, whereas the effects from FDI to growth are less apparent. This is a relatively robust result independent of estimation method. While this might be interpreted as if FDI is not important to growth we stress that this would be an analytical step too far. Lack of short run causality from FDI to growth does not imply that FDI has no impact on long run growth. In fact, there are as already noted many reasons to suggest that a long run link between FDI and growth exists – at least under a set of specific country circumstances.

The relatively strong association between FDI inflows and growth in combination with the evidence of short run causality from growth to FDI is one potential explanation why policymakers and economic advisers continue to emphasize the need for establishing an enabling environment for attracting FDI to individual countries. This also forms part of the justification for the central question in this paper, which is whether recipient countries are competing against each other or whether FDI flows to one country complement flows to neighbouring counterparts. This topic has at best received scant attention in the literature in spite of it being highly policy relevant. As a case in point, decision makers in Vietnam are keenly aware of the complex historical and economic relationships with China, and they clearly worry about whether Vietnam is loosing out when FDI flows find their way to China.

A priori it is uncertain whether FDI to individual countries stimulates or crowds out investment to regional counterparts. A variety of spillover effects from FDI flows from one country to another are possible. It is equally correct that potential decisions about where to direct FDI flows are at times mutually exclusive. To provide empirical evidence on this issue, we study the dynamic association between FDI-shares in the five selected countries within a vector autoregressive model.

Our results suggest that FDI inflows to the sample of Asian countries in focus are highly interdependent. Moreover, by way of illustration it emerges that an increase in China's FDI share actually complements FDI inflows to Vietnam. In contrast, increased FDI to Thailand and Indonesia actually harm Vietnam in terms of relative FDI inflows. Based on this short term empirical regularity, Vietnam should be less concerned about FDI to China than to other countries in the region, and this is confirmed with reference to long run responses as well.

Following this introduction, Section 2 provides a brief literature review of the association between FDI inflows and economic growth. In addition, we summarize our short run Granger-causality analysis using a variety of panel data estimation techniques. Section 3 goes on to document co-movements of FDI-inflows during the period 1970-2000. Focus is on the statistical analysis of the shares of FDI inflows in Asia. Section 4 provides discussion and conclusions and offers a tentative explanation of some of the observed regularities identified in the data.

2. FDI and economic growth: an analysis of causality

During the last decade a number of interesting studies of the role of foreign direct investment in stimulating economic growth has appeared. In an excellent survey, de Mello (1997) lists two main channels through which FDI may be growth enhancing. First, FDI can encourage the adoption of new technology in the production process through capital spillovers. Second, FDI may stimulate knowledge transfers, both in terms of labor training and skill acquisition and by introducing alternative management practices and better organizational arrangements. Another survey by OECD (2002) underpins these observations and documents that FDI has contributed positively to income growth and factor productivity in 11 out of 14 studies reviewed.

It is important to highlight, however, that both de Mello (1997) and OECD (2002) stress that one key insight from all the studies reviewed is that the way in which FDI affects growth is likely to depend on the economic and technological conditions of the host country. More specifically, it appears that developing countries have to reach a certain threshold of development, in education and/or infrastructure, before they are able to capture potential benefits associated with FDI. Hence, FDI tends to have more limited growth impact in technologically less advanced countries.

Four studies, relying on a variety of cross-country regressions, have looked into necessary conditions for identifying a positive impact of FDI on economic growth. Interestingly, they stress different, but highly correlated, aspects of development. First, Blom-

ström *et al.* (1994) argue that FDI has a positive growth-effect when the country is sufficiently rich in terms of per capita income. Second, Balasubramanyam *et al.* (1996) stress that trade openness is crucial for acquiring the potential growth impact of FDI. Third, Borenztein *et al.* (1998) find that FDI raises growth, but only in countries where the labour force has achieved a minimum threshold of education. Finally, Alfaro *et al.* (2003) show that FDI promotes economic growth in economies with sufficiently developed financial markets.

The three last studies all address possible endogeneity of FDI flows in the growth regressions, and they find evidence of endogeneity in terms of significant changes in the parameter estimates. These three studies also take due note of the difficulty of finding good instruments for the FDI flows, which leads to the practice of including lagged values of FDI as the prime instrument in order to arrive at consistent parameter estimates of the impact of FDI on growth. However, in terms of policy advice it becomes difficult on this basis to formulate precise recommendations about the ways in which individual countries can attract FDI, apart from pointing to the usefulness of general growth enhancing policies. To illustrate, FDI is likely to flow to developing economies when their growth prospects make them relatively attractive to foreign investors. As a result, variables related to the growth dynamics of the recipient economy may well be strongly associated with FDI and hence stimulate larger inflows hereof.

To clarify whether or not good growth prospects do attract FDI inflows, we focus in what follows on short run causality between economic growth and FDI in a panel data set for our sample of five Asian countries (China, Indonesia, Malaysia, Thailand and Vietnam) during the period 1970-2000. FDI data were as already noted obtained from the UNCTAD FDI database, whereas real GDP and current GDP data come from World Development Indicators 2002.[3]

Temporal causality between growth and FDI can be explored in several ways. Yet the most popular econometric analysis seems to be bi-variate Granger-causality tests. In this section we follow this line of analysis and look at a model for FDI and growth. It is however important to be aware of the limitations of this kind of analysis as discussed by Hamilton (1994) and references therein.

In short, output growth is said to Granger-cause FDI inflows, when better predictions of FDI inflows are obtained when lagged values of output growth are included in the information set in addition to lagged values of FDI inflows. In more formal terms, the

[3] The data series for China are only for the period 1980-2000.

causality between growth and FDI can be estimated using a VAR model for growth and FDI given by the following equations:

$$\begin{aligned} g_{it} &= \alpha_{i0} + \alpha_{i1}t + \sum_{j=1}^{n} \eta_{ij} g_{it-j} + \sum_{j=1}^{n} \mu_{ij} FDI_{it-j} + u_{it} \\ FDI_{it} &= \beta_{i0} + \beta_{i1}t + \sum_{j=1}^{n} \lambda_{ij} g_{it-j} + \sum_{j=1}^{n} \gamma_{ij} FDI_{t-j} + \varepsilon_{it} \end{aligned} \tag{1}$$

where g_{it} and FDI_{it} is the rate of growth of output and FDI inflows in percent of GDP, respectively, in country i at time t. The letters, α, η, μ, β, λ, and γ denote scalar parameters, and n is the number of lags chosen so that u_{it} and ε_{it} are innovation processes. The null-hypotheses to be tested are that (i) FDI does not Granger cause economic growth in country i $(\mu_{ij} = 0 \,\forall\, j = 1,\ldots,n)$, and (ii) growth does not Granger cause FDI in country i $(\lambda_{ij} = 0 \,\forall\, j = 1\ldots,n)$. If one of the null-hypotheses is rejected we loosely refer to this by stating respectively that FDI Granger causes growth or that growth Granger causes FDI.

Possible non-stationarity of the time-series poses a problem in Granger-causality tests. We therefore tested for unit-roots. As the time-series are fairly short we made an effort to increase the precision of the unit-root tests by a rigid lag selection procedure and by using a small-sample correction of the unit-root tests. Thus, the tests for unit-roots were carried out by first selecting the appropriate lag for each series using three information criteria (AIC, SC, and HQ) and sequential *F*-tests. Subsequently, the null-hypothesis of a unit-root was tested using Johansen's likelihood ratio test and applying the Bartlett-correction given in Johansen (2002).

The null-hypothesis for GDP growth was a unit-root without drift, while the alternative was mean stationarity. For FDI the null-hypothesis was a unit-root with drift against an alternative of trend-stationarity. Non-stationarity of the growth rates was rejected at conventional levels of significance for all countries. For FDI non-stationarity could not be rejected for China and Malaysia. However the hypothesis was rejected at conventional levels of significance for the three other countries. Hence, the models for Granger-causality tests are formulated under the maintained assumption that growth rates are mean stationary and FDI inflows are trend stationary.

Our panel has 28 observations in the time series dimension and five observations in the country dimension.[4] Hence, the most general feasible panel data estimator in terms of slope parameters is Zellner's SUR-estimator (Zellner, 1962). In the SUR model all parameters vary across countries, and cross-country interdependence is taken into account

[4]It is noted that we have only 19 observations for FDI and growth in China.

by the contemporaneous correlation between the error terms. Accordingly, we start by reporting the results of SUR-regressions of eq. (1) in Table 1.

[Table 1 about here]

The assumption of auto-regression in growth is somewhat questionable as the regression results for three of the five countries in the upper half of Table 1 show that none of the slope parameters are statistically significant (Indonesia, Malaysia, and Vietnam). In fact, the tests for overall significance of the regressions lead to the conclusion that the model for China is the only one that in statistical terms outperforms predicting the growth rate by the constant mean. Obviously, the lack of statistical significance of any of the parameters may be due to lack of observations relative to the number of parameters in the SUR-model. However, it is important to keep in mind that when we conclude that FDI does not Granger cause growth in the short run, we could just as well state that growth itself has no predictive power for the subsequent growth rates. Turning to the specific tests for Granger causality, the causal directions are tested using Wald tests and there appears to be no causal relationship from FDI to growth in any of the selected countries.

The autoregressive model for FDI appears to give a better fit compared to the growth equations, although the time trend is the only significant regressor in the equations for Thailand and Vietnam. Based on the results in the lower half of Table 1 we conclude that growth Granger-causes FDI inflows in Indonesia and Malaysia, but not in China, Thailand and Vietnam. However, for China we note that the first lag of growth is significant at the 10% level of significance.

The SUR estimator is efficient given the assumption of homoskedastic innovations in each country. Given the recent history in the five Asian countries under study, there is reason to look closer at this assumption. We therefore tested for heteroskedasticity using the Breuch-Pagan test with the fitted values as regressors in the auxiliary regressions.[5] In the growth equations the hypothesis of homoskedasticity was rejected for Indonesia and Thailand, while it was rejected for Thailand and Vietnam in the FDI equations.

In order to assess the effect of the possible heteroskedasticity on the regression results we re-estimated the model using OLS, equation by equation, with White's heteroskedasticity robust standard errors. This estimator is consistent under heteroskedasticity, but less efficient under homoskedasticity compared to the SUR estimator.

[5] The sample size makes White's test for heteroskedasticity infeasible.

The results of the OLS regressions are given in Table 2, which shows that the change in estimator does not lead to qualitative changes in the results. We also find that FDI does not Granger cause growth in any of the countries, while growth Granger causes FDI in Indonesia, Malaysia, and - with weaker support - China.

[Table 2 about here]

Imposing homogeneity of the slope parameters can increase the efficiency of the estimators and hence lead to improved inference with respect to the Granger causality tests. In the first column of Table 3 we give results of constrained SUR regressions where all slope parameters ($\eta, \mu, \lambda, \gamma$) are restricted to be equal across equations while the intercept and trend parameters are unrestricted. The cross-equation restrictions are easily accepted in the growth regressions (a *p*-value of 0.89), while they are marginally rejected in the FDI regressions (a *p*-value of 0.02). The results of the constrained SUR regression show that on average growth Granger causes FDI, while we maintain that FDI does not on average Granger cause growth.

[Table 3 about here]

As for the SUR regressions in Table 1, we assess the impact of heteroskedasticity by OLS regressions with robust variance estimates. In the second column of Table 3 we report results of an OLS regression in which the slope parameters are equal across countries, while the intercepts and trend parameters are unrestricted as in the SUR-regression in column 1. There are only minor changes in the parameter estimates in the growth equations, and general conclusions are the same. There are somewhat larger changes in the parameter estimates in the FDI equations,[6] but the impact of growth is unchanged. In sum, we still find that growth Granger causes FDI.

As we reject the hypothesis of equal slope parameters in the FDI equations it may be better to use a random coefficients model instead of the SUR and OLS models. We therefore report the results of a Swamy (1970) type random coefficients model in the third column of Table 3.[7] The results are as expected in good accordance with the SUR and OLS results for the growth equations. It is more interesting to note that the point estimates in the random coefficients model are very close to those of the SUR regression for the FDI equations, although the lagged growth rates are statistically insignificant.

[6] The lagged value of FDI is insignificant in the OLS regression, while it is significant in the SUR regression.

[7] It is important to note that the random coefficient estimators may not perform well in our sample as we only average over five countries.

This leads to the result that the hypothesis of no causal effect from growth to FDI is only marginally rejected at the 10% level of significance in the Swamy model.

The Swamy model uses weighted averages of the country specific OLS parameter estimates (see Swamy, 1970 and Hsiao, 1992 among others). Recently Pesaran and Smith (1995) have advocated for using simple averages of the OLS parameter estimates in dynamic heterogeneous panels (the mean group estimator, MGE). Asymptotically, the Swamy estimator and the MGE are equivalent, although the Swamy estimator is efficient under the assumption of residual homoskedasticity. This means that the MGE offers a simple way of assessing the impact of heteroskedasticity on the random coefficients results. In the fourth column of Table 3 we report the MGE results using robust variance estimates. Once again, there are only minor changes in the parameters in the growth equations and no change in the conclusion. In the FDI equations, the lagged growth rates become significant along with the second lag of FDI, where the latter result is driven by the large and highly significant parameter estimate for Indonesia. Based on the MGE we once more conclude that there is unidirectional causality from growth to FDI.

The final regression we present in Table 3 is a two-way fixed effects regression. It is therefore qualitatively different from the ones discussed so far. In this regression we substitute the country specific time trends by common time dummies. This is a frequently used way of eliminating contemporaneous correlations in the innovations. In terms of Granger causality the hypothesis is slightly changed compared to the models without time dummies. The alternative hypothesis in the two-way FE-regression is that lagged FDI inflows (growth) increase growth (FDI) when it is above the *average in the country group*. This is in contrast to the previous models in which FDI is measured relative to a country specific trend and growth is measured relative to a country specific mean.

The final column in Table 3 shows that the change in model does lead to a qualitative change in conclusion. We find bidirectional Granger causal effects, i.e., in this model FDI Granger causes growth in addition to the already established causality from growth to FDI. Another interesting result of the two-way FE regression is that the impact of lagged growth in the growth equation is unchanged compared to the other regressions. It is only the impact of lagged FDI which changes. This indicates that the specification using a country specific detrending of FDI may be too simplistic a formulation. On the other hand, the result may also be due to over-parameterization in the two-way FE model.

Comparing our results with other studies of Granger causality between growth and FDI reveals good correspondence between our results and previous findings. The study with the closest resemblance to our work is Zhang (2001). He looks at annual data for 11 countries on a country-by-country basis, dividing the countries according to the time series properties of the data. Zhang's results are therefore comparable to our SUR, OLS, and Panel results, but not with our two-way FE regression. Zhang finds unidirectional causation from growth to FDI in Malaysia and Thailand and bidirectional causation in Indonesia.[8] Turning to de Mello (1999), he looks at causation from FDI to growth in 32 countries of which 17 are non-OECD countries. In the sample of non-OECD countries he finds no causation from FDI to growth based on one-way FE regressions and the mean group estimator. Finally, Choe (2003) analyzes 80 countries aggregating over time to five year averages. In his GMM regressions he includes time dummies. His results are therefore comparable to those of our two-way FE method, and conclusions are similar as Choe finds bidirectional causality between growth and FDI.

We conclude that the causal link from growth to FDI is quite robust while the finding of a causal link from FDI to growth is highly dependent on model specification. This is not surprising given the cross-country growth regression results surveyed in the beginning of this section. If threshold externalities play an important role for the impact of FDI on growth we should not expect to find causal links in a linear model. Moreover, as the impact of FDI on growth is likely to take time to materialize, this effect is hard to identify in annual data where business cycle fluctuations dominate. We reiterate that our results should not be interpreted as supporting that FDI has no impact on long run growth. Instead, we wish to stress the clear short run causality from growth to FDI in our data. This finding is highly policy relevant. It shows that growth stimulating policies trigger increased inflows of FDI in the short run, and this may in turn underpin higher long run growth. In sum, establishing a good growth enabling environment appears an important priority in stimulating FDI.

In spite of this general policy recommendation, it is unclear what happens to FDI flows to individual countries if all countries in a region engage in growth and FDI stimulating policies. Tax competition among countries in the OECD is a much discussed topic. In contrast, competition for FDI inflows across borders among developing countries has not attracted much attention, and it is *a priori* not evident whether FDI to individual countries stimulates or crowds out investment to regional counterparts. One can easily think of forces generating both results. In the next section we therefore focus on wheth-

[8] For Indonesia the result is based on an error-correction model, as Zhang finds cointegration between the log of FDI and the log of income in Indonesia.

er FDI inflows to one country complement or substitute FDI to other countries in the region.

3. Co-movements of FDI-inflows

The most common perception of FDI inflows to different countries is undoubtedly that such flows are substitutes rather than complements. However, in developing areas it is clearly possible that FDI-inflows to one country generate increased inflows to neighbouring countries. One may think of foreign investors looking at regions as competing while individual countries within regions complement each other because of knowledge spillover and other economies of scale. In this section, we take a first look at the issue of substitution versus complementarity in FDI among the five selected Asian countries. From the outset we wish to stress that our analysis is data-driven and should be interpreted as an attempt to shed light on existing regularities, which might stimulate further theoretical and analytical work.

In Figure II we have shown the pattern of FDI-shares within Asia. We have computed the shares of FDI-flows to the five countries of interest, while the rest of the Asian countries are grouped together under the label 'Rest of Asia' (RoA). The specific selection of countries rests on two premises. First, Hong Kong, Taiwan, and Singapore were excluded in advance, as these countries are markedly different from other countries in the region.[9] Second, we conducted a pre-testing exercise to identify a set of countries with sizable FDI-shares, which at the same time influence each other.[10] The most interesting result of the pre-testing is that FDI inflows to the Republic of Korea do not seem to be of importance for flows to the group of countries under study here and vice versa.

[Figure 2 about here]

Measured by average shares of total FDI-inflows to Asia, China is by far the largest recipient in the region with an average share of 20.7% during the period 1970-2001.[11] Malaysia ranks second (15.2%), while Indonesia and Thailand are in third and fourth place with 7.4% and 5.5%, respectively. Finally, Vietnam is the smallest recipient in the group with an average share below one percent.

[9] The average share of FDI-inflows over the period 1970-2001 is about 17 percent to each of Hong Kong and Singapore. Hence in terms of volume of the flows Hong Kong and Singapore are certainly interesting.

[10] We used PcGets to obtain parsimonious equations for the FDI share in each country, see Hendry and Krolzig (2001).

[11] This is so in spite of non-existent inflows prior to 1979.

Looking closer at the time paths of FDI shares, we note that on average Malaysia and Indonesia were the largest recipients in the 1970s. Relative FDI-inflows were highly volatile in that period and there appears to be quite a strong negative co-movement between the inflows to Malaysia and Indonesia. From 1980 and onwards China enters the stage, and during only five years the Chinese share climbed from zero to almost 40% of total inflows to Asia. Moreover, during the 1990s the Chinese share increased to around 60% in some years.

This significant change in the levels of the relative shares of FDI-inflows makes it difficult to establish a precise notion of positive and negative co-movements. Nevertheless, from Figure II it appears as if Malaysia did not loose much ground when China entered. Indeed, from 1985 and onwards China and Malaysia appear to move together. It is hard to tell if the changes in the FDI-shares to China and Malaysia are at the expense of the three other countries in our group or at the expense of the rest of the countries in Asia. Therefore we turn to a more formal statistical analysis of the FDI-shares focusing on the degree of competition.

We hold no prior beliefs about who are leaders and followers among the Asian countries in terms of FDI-inflows, and we are unaware of any literature on this issue. We therefore concentrate on the dynamic relationships among FDI-shares using a vector autoregressive (VAR) model. It is noted that the FDI-shares for China, Indonesia, Malaysia, Thailand and Vietnam and RoA sum to 100% by construction. Thus, we can concentrate on the five selected countries in the analysis and leave the impact on and from RoA to be given implicitly. Accordingly, in what follows we do not derive all the parameters for RoA although this could be done in a straightforward manner. In order to increase the readability of the regression results we have multiplied Vietnam's FDI-share by ten such that Vietnam's share is measured per thousand instead of per cent. This scaling has of course no bearing on the results apart from the readability of the tables.

China had as already noted no FDI-inflows prior to 1980. Strictly speaking, this constancy of the flows violates some of the basic assumptions underlying the vector autoregressive model. We have corrected for this problem in a crude way, including a dummy variable for the period 1970-79.[12] We estimated a second order VAR-model and ap-

[12] This 'correction' was the preferred choice among more sophisticated alternatives because of its relative simplicity.

plied the standard set of diagnostic tests (residual autocorrelation, heteroskedasticity, and normality). The model passed all tests.[13]

Figure II shows that the shares of FDI-inflows do not have constant means. It is therefore of interest to test whether the shares are non-stationary, and whether they cointegrate. We do not interpret the presence of cointegration vectors as steady state relationships as such. It is more intuitive to think of them as a way of testing whether there are significant low-frequency co-movements among the FDI-shares. If the shares are stationary the low-frequency co-movements are all zero since the shares return at some point to their constant means. At the other extreme, if there is no cointegration, the low-frequency co-movements will all be non-zero. Finally, the presence of cointegration allows for both zero and non-zero low-frequency movements.

Table 4 reports the results of our cointegration analysis. There is strong empirical evidence against the hypothesis that the shares are not cointegrating at all. It is more difficult to tell from the data whether there are one or two cointegration relationships. For the sake of simplicity we have chosen to follow a strict testing scheme and reject the hypothesis of more than one cointegration relationship at the 5% level of significance.

[Table 4 about here]

The five countries of interest have all changed policies towards FDI during the period under study. Consequently, we have looked into the question of structural breaks in the VAR model. As we have no *a priori* information about a specific year for which a possible break should occur for the group of countries, we rely on the fluctuation test of the eigenvalues proposed by Hansen and Johansen (1999). With fixed short run parameters we obtain a fluctuation statistic of 0.73. The critical value of the test is 1.63 (at the 5% level of significance). On this basis, we can conclude that the parameters of the cointegration space are constant over time.

The estimated cointegration relation is reported on the right-hand side of Table 4. The structure of the cointegration relationship is surprisingly simple. China and Malaysia both have weights equal to one whereas Indonesia, Thailand, and Vietnam have weights equal to minus one. The implication is that when low frequency co-movements are studied, the five countries separate into two groups of positive and negative weights.

[13] The assumption of normality of the residuals is only accepted at marginal levels as the multivariate test has a *p*-value of 2.3%. All results are available from the authors on request.

Table 5 presents the estimated parameters of the error-correction model for the FDI-shares. The dependent variables are the year-to-year changes in the shares while the explanatory variables are the lagged changes in the shares and the restricted cointegration vector given in Table 4. In Table 5, we report Nyblom tests of parameter instability in addition to the point estimates and their *t*-values, and there is no indication of parameter instability. Hence, using the Nyblom test we find no support for suggesting that changes in policies towards FDI inflows in Asian countries make the parameter estimates unstable.

The main results in Table 5 are that China, Malaysia, and Thailand, in addition to having significant responses to own lagged changes in FDI shares, all respond to at least two other countries in the group and to the error-correction term. Thus, these three countries appear to be highly dependent on FDI-flows to neighbouring countries. Moreover, while Malaysia and Thailand seem to loose shares to other countries in the sample, China gains whenever Thailand or Vietnam increase their share. Indonesia is at the other extreme. Only a weak response to changes in Malaysia can be identified apart from the significant error correction.

[Table 5 about here]

Vietnam is interesting in the present context for three reasons. First, while it appears as if Vietnam looses shares to China in the short run, there is no significant impact of this kind from any of the other countries. In contrast, when the share of FDI-flows to Vietnam increases, there is a significant gain in China and significant losses in Malaysia and Thailand. Finally, Vietnam is the only country for which we do not record a significant impact from the low-frequency co-movements represented by the error-correction term. It therefore seems as if Vietnam is relatively unaffected in the short run by the group of countries under study as a whole.

The complete set of dynamic responses to changes in the FDI-shares in the individual countries is difficult to visualize from the error-correction representation of the model. We therefore estimate the reduced form impulse-response functions of the VAR model.

[Table 6 about here]

The estimated moving average parameters are given in Table 6. For each of the countries, China, Malaysia, Indonesia, and Thailand we look at an initial change in the FDI-share of one percentage point and measure the responses in percent. For Vietnam, we use an initial change of 0.1 percentage point and measure the responses as per thousand.

Because of the adding-up constraint on the shares, we are implicitly looking at the effect of a change in the FDI-flows *from* RoA *to* each of the countries in the model. The response parameters in Table 6 are ordered such that the rows record the responses in each of the countries to the five initial shocks, while the columns reflect their impact. The responses are given for both short and long run time horizons.[14] Asterisks in the table indicate the precision of the estimated responses. Two asterisks denote that the response is more than two standard errors away from zero, while one asterisk denotes that the response is more than one standard error away from zero. This corresponds roughly to 95% and 64% confidence bands.

In the very short run China responds strongly to a change in its own share. One year after the initial shock, the FDI share remains around one percentage point higher. Moreover, in the long run an initial change of one percentage point leaves a lasting increase in China's share of FDI of about one-half of a percentage point. The results for China are also of interest because it appears that China gains from increases in the FDI shares in all of the other four countries except Malaysia. For example, a one percentage point increase in Thailand's share leads to a one percentage point increase in China's share of FDI one year after the initial change. This positive response increases slightly in the second and third year, whereas the permanent long run impact is an increase in China's share of around 0.6 percentage point. This is in fact more than Thailand's own permanent increase. China's response to a change in Vietnam's share is also large and positive although the response seems to dampen at a somewhat faster rate as compared to a shock to Thailand. Yet, also in the case of Vietnam, the permanent change in China's share of FDI greatly exceeds Vietnam's own permanent response. A similar picture emerges in relation to Indonesia, so Malaysia is the only country for which an initial change in the share of FDI does not lead to a permanent increase in China's share of FDI. However, this result is in fact not significant, so the overall impression is convincing. FDI to Indonesia, Thailand and Vietnam complements FDI to China.

Malaysia comes out as an opposite case compared to China. This is so since Malaysia seems to loose FDI-shares whenever one of the other countries in the group experiences a positive shock. Moreover, the losses are quite substantial. This result holds true for all countries in terms of permanent changes, and in the short run Thailand is the only exception. Malaysia clearly comes across as a country which is competing for FDI with the other countries in the group.

[14] By long run we mean the infinite time horizon and short run impacts are recorded for one, two and three year periods.

Results for Indonesia and Thailand are in some sense 'in-between' those for China and Malaysia. Indonesia and Thailand gain from shocks to some countries while they loose from shocks to other countries, and they do not compete or complement on a bilateral basis. One notable difference between Indonesia and Thailand is that Indonesia seems to get a permanent gain in FDI-share after positive shocks to China and Malaysia, while Thailand seems to experience a permanent loss from such shocks. However, the permanent response in Thailand's FDI-share following a shock to Malaysia is not well determined.

Vietnam stands out as the country in our sample with the smallest gains and losses from changes in FDI-shares elsewhere even after correcting for the relatively small size of the Vietnamese economy. In the very short run (one year after the initial shock) all responses are small and rather imprecisely determined, except for the response to a shock to Malaysia, which seems to have a positive and strong impact on Vietnam. The permanent responses to shocks to the other countries in the group are small and statistically insignificant, again with the exception a shock to Malaysia. Moreover, the permanent response to an initial shock to Vietnam's own FDI-share is small compared to the permanent own responses in the other countries.[15] Finally, while it is a widely held belief that Vietnam is competing with China in terms of FDI-flows, this hypothesis is not confirmed by the present study in the long run. The point estimate of Vietnam's response to a shock to China appears negative in the very short run, but the permanent response is close to nil and highly insignificant. Hence, there is an interesting asymmetry between Vietnam and China in the long run. China seems to gain from increasing in FDI-shares to Vietnam, whereas Vietnam is unaffected by increasing FDI-shares to China. Although a 'bandwagon' effect (such as the China-Indonesia result) would be the ideal situation for Vietnam, things could be much worse involving asymmetric substitution effects such as in the China-Malaysia relationship.

In order to complete the analysis of FDI-shares, it is of interest to look at the permanent changes in the FDI-shares between the selected group of countries, on the one hand, and RoA, on the other. All experiments use as the initial shock a reallocation of FDI-shares from RoA to each of the countries in the group, but over time a fraction of the initial reallocation of FDI may return to RoA. In the last row of Table 6 we report the estimated permanent responses in the FDI-share to RoA. It appears that there is a marked difference in the permanent change in RoA's FDI-share. Because of the losses in Malaysia and Thailand following an initial change in China's share the permanent drop in the share of RoA is below one-half. In contrast, reallocations to Malaysia, Indonesia or

[15] Compare the point estimate of 0.4 to the other point estimates in the diagonal of the long-run responses, which are all above 0.5.

Thailand lead to permanent losses in the FDI-share in RoA close to the initial one percent shock. Finally, an initial reallocation towards Vietnam leads to the smallest permanent loss in the FDI-share in RoA. More than 70% of the initial change returns to RoA in the long run. Viewed from this angle, Vietnam is not a strong contestant for FDI with respect to the rest of Asia as a group.

4. Discussion and conclusions

Foreign direct investment is widely perceived as an important growth catalyst, and the academic literature has generally found a positive association between FDI inflows and growth, noting that threshold effects are crucially important. In parallel, economic policies in developing countries have become increasingly focused on attracting FDI flows. Interestingly, based on existing literature it is far from clear whether developing countries are in reality competing or complementing each other in this effort.

In our attempt at studying this topic, we put as a first step focus on the causal relationships between FDI and economic growth in a sample of five Asian countries using a variety of estimation techniques. It emerged quite convincingly that economic growth Granger-causes FDI. On the other hand, causality from FDI to growth is much less apparent in our sample of countries. This finding should not be used to suggest that FDI has no impact on long run growth. Instead, our results underpin that policymakers and economic advisers would be well advised to pursue an enabling growth enhancing economic environment. This is an effective way to help stimulate FDI flows.

Having established that countries are able to attract FDI through growth, it comes as no surprise why policymakers do indeed devote so much attention to FDI flows. On this background, we found it meaningful to ask in more specific terms whether FDI to individual countries stimulates or crowds out investment to regional counterparts. Thus, we were motivated to move on to the second step of our analysis, where we concentrated on the dynamic association between FDI-shares, relying on a vector autoregressive model.

The results from this enquiry into the data *inter alia* show the following country specific features:

- China generally benefits both in the short and long run from increased FDI shares to other countries in our sample, the exception being Malaysia. The position of China is clearly very favourable and the Chinese government need not be concerned about FDI competition from Indonesia, Thailand and Vietnam.

- In contrast to China, Malaysia generally competes with all the other countries in our group in both the short and long run. Malaysia would be justified in worrying about the sustainability of incoming FDI if other countries manage to advance in this area.
- Indonesia and Thailand are more mixed when it comes to FDI. They sometimes compete and they sometimes complement regional counterparts when it comes to the share of FDI flows.
- Vietnam is justified in being preoccupied with FDI to China, but only in the very short term. In the medium and long run there is no impact on the share of FDI to Vietnam when the share of China increases. Instead it appears Vietnam should in the long run be more concerned about the relationship to Indonesia and Thailand.

In sum, our results clearly document that FDI inflows to the Asian countries are highly interdependent. On a bilateral basis, the five selected countries in our sample either compete or complement each other in most cases. Altogether, this should certainly be taken into account by policymakers when identifying and designing appropriate strategies for attracting FDI. In this process, account should of course be taken of the more specific characteristics of the distribution of FDI by sector and country of origin for the individual countries in our sample.

Developing further insights into the specifics of FDI flows would go beyond the scope of the present paper. However, as a tentative illustration of the critical importance hereof, we include in Annex 1 two summary tables. On this basis, we can conclude that on average almost 60% of inward FDI to China, Malaysia, Thailand and Vietnam originate from no more than three sources. In the case of Indonesia this share is 33%. Similarly, FDI is generally highly concentrated in only a few sectors. These patterns no doubt can help explain the above general findings about the interrelationship of FDI flows.

For example, the strong negative co-movement between Malaysia and Indonesia is in all likelihood closely related to the fact that two out of the three most important FDI sectors are common and in addition they share Japan as a key source of FDI. Similarly, the negative long run relationship Thailand and Malaysia certainly appears closely related to overlap between FDI origin (USA and Japan) and sector focus (Electronics). Finally, the fact that Vietnam is at present relatively secluded is no doubt caused by the significant and in regional terms unique share of FDI going into the oil and gas sector (59%).

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Annex

Table A1: Distribution of FDI inflows by sector

	Vietnam*	China*	Indonesia*	Thailand*	Malaysia
Agriculture	5,82	2,17	2,89	0,42	NA
Industry	56,20	65,04	72,37	42,09	NA
Construction	8,27	2,66	0,99	5,94	NA
Transp. and communication	5,82	1,60	4,19	5,02	NA
Real estate	17,28	20,55	5,36	22,35	NA
Services	6,62	7,98	14,20	24,18	NA
Total	100,00	100,00	100,00	100,00	100,00

Source: Nguyen (2000), Doanh (2002), Wei & Lui (2001), Azis (1998), Brooker Group (2002), Internet Portal www.info.tdri.or.th and Internet portal www.bkpm.go.id

*Notes: Vietnam: Data from 1988-2000. Includes investment of domestic joint venture partners. Excludes FDI in oil and gas. China: Data from 1987-1998, contractual data. Indonesia: Data from 1990-2000. Excludes FDI in oil and gas, banking and insurance. Thailand: Data from 1988-2000.

Table A2: Distribution of FDI inflows by sector and originating country

	Top three sectors (% of total)		
Vietnam	Oil and Gas (59%)	Light industry (18%)	Heavy industry (9%)
China	Manufacturing (46%)	Real estate (16%)	Utilities (6%)
Indonesia	Chemicals and pharmacy (30%)	Paper, printing and publ. (11%)	Electronics (10%)
Thailand	Trade (25%)	Machinery and transport (11%)	Electronics (10%)
Malaysia	Electronics (51%)	Paper, printing and publ. (9%)	Non-metallic mineral prod. (8%)
	Top three originating countries (% of total)		
Vietnam	UK (30%)	India (25%)	Chinese Taipei (15%)
China	Hong Kong (41%)	USA (10%)	Virgin Islands (9%)
Indonesia	Japan (16%)	UK (9%)	Singapore (8%)
Thailand	Japan (27%)	USA (17%)	Singapore (13%)
Malaysia	USA (28%)	Japan (16%)	Netherlands (11%)

Source: OECD (2002)

Table 1: SUR estimates of the VAR for growth and FDI

		Dependent variable: Growth in GDP				
Country		China	Indonesia	Malaysia	Thailand	Vietnam
Growth	Lag 1	0.696**	0.239	0.181	0.420**	0.201
		(3.12)	(1.29)	(1.06)	(2.26)	(1.19)
	Lag 2	-0.557**	-0.019	-0.206	-0.128	-0.256
		(2.42)	(0.10)	(1.20)	(0.67)	(1.52)
FDI	Lag 1	0.339	-0.001	0.216	0.689	0.252
		(0.76)	(0.00)	(0.46)	(0.78)	(0.87)
	Lag 2	0.132	-1.175	0.079	-0.228	0.035
		(0.32)	(1.23)	(0.18)	(0.25)	(0.12)
Trend		-0.196	-0.126	-0.092	-0.160	0.165
		(1.01)	(1.11)	(0.76)	(1.33)	(1.11)
Constant		11.57**	7.816**	7.384**	6.706**	2.232
		(2.58)	(2.61)	(2.86)	(2.87)	(1.01)
R^2		0.53	0.26	0.09	0.32	0.27
Granger (p-values)		0.68	0.36	0.73	0.74	0.68
		Dependent variable: FDI				
Country		China	Indonesia	Malaysia	Thailand	Vietnam
Growth	Lag 1	0.232*	0.101**	0.105	-0.015	0.064
		(1.89)	(3.35)	(1.52)	(0.34)	(0.56)
	Lag 2	-0.077	0.021	0.140**	0.019	0.060
		(0.61)	(0.63)	(2.00)	(0.43)	(0.52)
FDI	Lag 1	0.234	0.448**	0.523**	0.271	-0.079
		(0.94)	(2.36)	(2.31)	(1.27)	(0.42)
	Lag 2	-0.251	0.422**	-0.207	0.012	0.136
		(1.10)	(2.30)	(1.04)	(0.05)	(0.71)
Trend		0.284**	0.046**	0.099**	0.061**	0.230**
		(2.66)	(2.80)	(2.28)	(2.33)	(2.38)
Constant		-5.071**	-0.862*	-0.278	-0.089	-2.427*
		(2.05)	(1.88)	(0.32)	(0.18)	(1.66)
R^2		0.69	0.70	0.70	0.48	0.43
Granger (p-values)		0.16	0.00	0.05	0.90	0.73
Observations		19	28	28	28	28

Notes: Absolute *t*-values in parentheses. * Significant at 10%; ** Significant at 5%.

Table 2: OLS estimates of the VAR for growth and FDI

		Dependent variable: Growth in GDP				
Country		China	Indonesia	Malaysia	Thailand	Vietnam
Growth	Lag 1	0.718**	0.186	0.161	0.634**	0.049
		(4.73)	(1.10)	(0.68)	(2.04)	(0.17)
	Lag 2	-0.567**	-0.024	-0.262	-0.138	-0.410*
		(2.37)	(0.12)	(1.38)	(0.68)	(1.67)
FDI	Lag 1	0.341	0.157	0.215	0.965	0.217
		(1.08)	(0.12)	(0.21)	(1.02)	(1.03)
	Lag 2	0.149	-1.853	0.243	0.097	0.144
		(0.65)	(0.91)	(0.30)	(0.11)	(0.62)
Trend		-0.220*	-0.120	-0.122	-0.177	0.209
		(1.72)	(1.20)	(0.67)	(1.16)	(1.35)
Constant		12.180**	8.645**	7.836**	5.111**	2.815
		(4.06)	(2.86)	(2.24)	(2.68)	(0.78)
R^2		0.53	0.27	0.09	0.36	0.31
Granger (p-values)		0.51	0.66	0.62	0.57	0.57

		Dependent variable: FDI				
Country		China	Indonesia	Malaysia	Thailand	Vietnam
Growth	Lag 1	0.264**	0.104**	0.097	-0.029	0.050
		(2.07)	(6.71)	(1.21)	(0.51)	(0.98)
	Lag 2	-0.086	0.030	0.128**	0.007	0.042
		(1.11)	(0.99)	(2.65)	(0.15)	(0.84)
FDI	Lag 1	0.200	0.461**	0.616**	0.264	0.065
		(0.56)	(2.50)	(2.23)	(0.90)	(0.20)
	Lag 2	-0.248	-0.496**	-0.211	-0.086	0.129
		(0.79)	(2.75)	(0.99)	(0.36)	(0.65)
Trend		0.316**	0.050**	0.084**	0.065**	0.199**
		(2.42)	(3.55)	(2.03)	(2.26)	(2.79)
Constant		-6.246**	-1.007	-0.383	0.066	-2.229**
		(2.10)	(2.81)	(0.36)	(0.23)	(2.31)
R^2		0.69	0.70	0.70	0.49	0.44
Granger (p-values)		0.15	0.00	0.03	0.88	0.57
Observations		19	28	28	28	28

Notes: Robust *t*-values in parentheses. * Significant at 10%; ** Significant at 5%.

Table 3: Panel estimates of the VAR for growth and FDI

Estimator		SUR	LSDV (Robust)	Swamy	MGE (Robust)	Two way FE (Robust)
		Dependent variable: Growth in GDP				
Growth	Lag 1	0.331**	0.301**	0.349**	0.350**	0.348**
		(3.41)	(2.74)	(2.31)	(3.67)	(3.42)
	Lag 2	-0.186*	-0.218**	-0.222*	-0.280**	-0.160*
		(1.91)	(2.40)	(1.88)	(3.32)	(1.68)
FDI	Lag 1	0.174	0.142	0.336	0.379	0.447**
		(0.98)	(0.86)	(1.50)	(1.12)	(2.78)
	Lag 2	-0.122	0.043	-0.103	-0.244	0.033
		(0.68)	(0.27)	(0.23)	(0.58)	(0.17)
Granger (p-values)		0.56	0.67	0.29	0.50	0.02
		Dependent variable: FDI				
Growth	Lag 1	0.080**	0.077**	0.084	0.097**	0.096**
		(4.69)	(2.90)	(1.61)	(3.36)	(2.48)
	Lag 2	0.021	0.037*	0.037	0.024	0.029
		(1.14)	(1.67)	(0.82)	(1.19)	(1.06)
FDI	Lag 1	0.319**	0.235	0.394**	0.321**	0.242
		(3.28)	(1.21)	(2.97)	(2.82)	(1.46)
	Lag 2	-0.008	0.053	-0.129	-0.182**	0.090
		(0.08)	(0.42)	(1.01)	(2.02)	(0.64)
Granger (p-values)		0.00	0.00	0.10	0.00	0.01
Observations		131	131	131	131	131

Notes: Absolute *t*-values in parentheses. (The *t*-values are robust when indicated in the heading).
* Significant at 10%; ** Significant at 5%.

Table 4: FDI-shares in five Asian countries: cointegration results

Rank test statistics				Estimated cointegration vectors		
Rank	Eigenvalues	Trace test[a]	p-value		Unrestricted	Restricted[b]
0	0.806	79.12	0.01	China	1	1
1	0.682	47.95	0.05	Malaysia	0.93	1
2	0.638	26.21	0.13	Indonesia	-0.83	-1
3	0.214	6.93	0.59	Thailand	-1.14	-1
4	0.116	2.35	0.13	Vietnam	-1.01	-1

Notes: [a]The trace test statistic is calculated using a degrees of freedom correction (see Reinsel and Ahn, 1992). [b]LR-test of restriction on the cointegration vector: $\chi^2(4) = 0.15$. The *p*-value is above 0.99

Table 5: Error correction models for the percentage shares of FDI-flows to five Asian countries, 1972-2000

	China	Malaysia	Indonesia	Thailand	Vietnam
Lagged changes of					
China	0,671**	-0.293**	-0.037	-0.052	-0.443**
	(5.61)	(3.11)	(0.32)	(0.94)	(2.73)
	[0.04]	[0.02]	[0.09]	[0.03]	[0.07]
Malaysia	0.079	-0.422**	0.353*	0.035	0.351
	(0.42)	(2.81)	(1.90)	(0.40)	(1.36)
	[0.09]	[0.31]	[0.15]	[0.05]	[0.37]
Indonesia	-0.113	-0.533**	0.210	-0.152**	0.268
	(0.73)	(4.35)	(1.39)	(2.12)	(1.27)
	[0.09]	[0.09]	[0.07]	[0.08]	[0.40]
Thailand	0.638*	-0.669**	0.264	-0.683**	-0.028
	(1.77)	(2.36)	(0.75)	(4.12)	(0.06)
	[0.07]	[0.49]**	[0.06]	[0.11]	[0.16]
Vietnam	0.709**	-0.372**	0.139	-0182**	-0.791**
	(4.68)	(3.11)	(0.94)	(2.60)	(3.83)
	[0.03]	[0.06]	[0.16]	[0.10]	[0.04]
Error correction loading	-0.427**	-0.170**	0.332**	-0.107**	0.137
	(4.40)	(2.22)	(3.51)	(2.40)	(1.04)
	[0.35]	[0.18]	[0.18]	[0.21]	[0.06]
R^2	0.78	0.58	0.46	0.43	0.54
Std. Error	6.12	4.83	5.97	2.82	8.32
Joint instability test	1.88	1.57	1.66	1.62	1.75

Notes: The dependent variables are the year-to-year changes in the FDI-shares to the five countries. Absolute *t*-values in parentheses. Nyblom-statistics in brackets. Critical values for the Nyblom test of the individual parameters are 0.35 (10%) and 0.47 (5%). Critical values for the joint instability tests are 1.89 (10%) and 2.11 (5%) (see Hansen, 1992). * Significant at 10%, ** Significant at 5%.

Table 6: Estimated moving average parameters

Horizon	Response in	Shock to China	Shock to Malaysia	Shock to Indonesia	Shock to Thailand	Shock to Vietnam
1. Year	China	1.016**	-0.254	0.058	1.079*	1.141**
		(0.195)	(0.273)	(0.229)	(0.543)	(0.161)
	Malaysia	-0.460**	0.350*	-0.338*	0.077	-0.294**
		(0.153)	(0.215)	(0.180)	(0.427)	(0.127)
	Indonesia	-0.015	0.272*	0.320*	-0.101	-0.043
		(0.156)	(0.220)	(0.184)	(0.436)	(0.129)
	Thailand	-0.083*	-0.208**	-0.052	-0.247*	0.006
		(0.074)	(0.103)	(0.087)	(0.205)	(0.061)
	Vietnam	-0.253*	1.020**	0.494*	1.151*	-0.328*
		(0.236)	(0.332)	(0.278)	(0.659)	(0.196)
2. Year	China	0.237	0.853*	0.737*	1.553*	0.388*
		(0.426)	(0.559)	(0.486)	(1.078)	(0.309)
	Malaysia	-0.216*	0.275*	0.247*	0.579*	-0.192*
		(0.198)	(0.273)	(0.246)	(0.550)	(0.157)
	Indonesia	-0.165*	-0.069	-0.725**	-0.399	0.043
		(0.161)	(0.219)	(0.206)	(0.445)	(0.124)
	Thailand	-0.117*	-0.257**	-0.023	-0.149	0.037
		(0.062)	(0.110)	(0.100)	(0.246)	(0.073)
	Vietnam	0.096	0.019	0.130	0.886	0.178
		(0.303)	(0.449)	(0.399)	(0.934)	(0.273)
3. Year	China	-0.219	0.410	0.471	1.288*	0.158
		(0.466)	(0.637)	(0.595)	(1.241)	(0.343)
	Malaysia	-0.231*	-0.007	0.119	-0.279	-0.179*
		(0.202)	(0.303)	(0.240)	(0.494)	(0.152)
	Indonesia	-0.037	0.014	-0.246	0.243	-0.049
		(0.165)	(0.215)	(0.270)	(0.469)	(0.153)
	Thailand	0.020	-0.037	0.020	-0.246*	-0.120*
		(0.071)	(0.093)	(0.105)	(0.171)	(0.069)
	Vietnam	-0.017	-0.008	0.091	0.728	0.428*
		(0.268)	(0.427)	(0.368)	(0.756)	(0.253)
Long run	China	0.550**	-0.037	0.684**	0.644**	0.516**
		(0.190)	(0.128)	(0.173)	(0.264)	(0.114)
	Malaysia	-0.353**	0.524**	-0.213**	-0.329**	-0.191**
		(0.114)	(0.079)	(0.104)	(0.159)	(0.068)
	Indonesia	0.380**	0.357**	0.661**	-0.042	-0.007
		(0.143)	(0.099)	(0.131)	(0.200)	(0.081)
	Thailand	-0.149**	-0.057*	0.003	0.601**	-0.071*
		(0.063)	(0.045)	(0.060)	(0.089)	(0.038)
	Vietnam	-0.033	0.186**	-0.193*	-0.243*	0.403**
		(0.111)	(0.089)	(0.112)	(0.171)	(0.075)
Memo item	Rest of Asia	-0.425	-0.806	-1.116	-0.849	-0.286

Note: Standard errors in parentheses. ** Denotes a response exceeding two standard errors. * Denotes a response exceeding one standard error.

Figure 1: FDI flows to Asia, 1970-2000

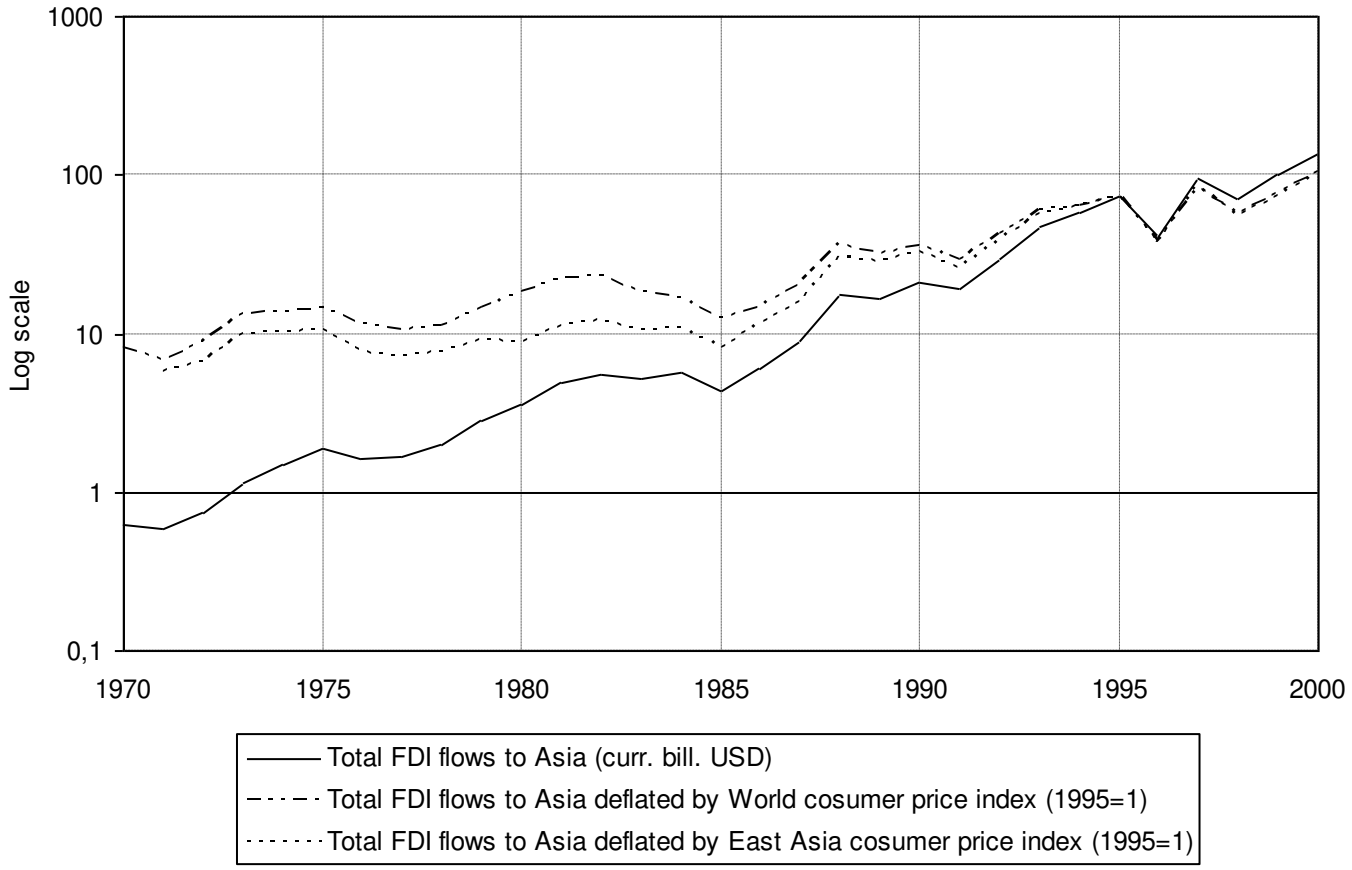

Figure 2: Shares of total FDI-flows to Asia for five Asian countries, 1970-2000