



**Latin America/Caribbean and Asia/Pacific
Economics and Business Association**

An initiative of the Inter-American Development Bank and the Asian Development Bank Institute

**First LAEBA Annual Meeting
Beijing, China – December 3-4, 2004**

**Does China Have and Impact on Foreign Direct
Investment to Latin America?**

***Alicia García- Herrero and Daniel Santabárbara,
Bank of Spain***

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WORKING PAPER No.31
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**PRESENTED AT THE 2004 LAEBA ANNUAL CONFERENCE, BEIJING, PEOPLE'S REPUBLIC OF
CHINA • DECEMBER 3-4, 2004**

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Edited by the Integration and Regional Programs Department (INT) of the IADB

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Does China Have an Impact on Foreign Direct Investment to Latin America?

Alicia García-Herrero and Daniel Santabárbara¹

This version: 30 December 2004

We analyze empirically whether the emergence of China as a large recipient of FDI has affected the amount of FDI received by Latin American countries. For a long time span (from 1984 to 2001) we do not find a substitution from Latin American inward FDI to China, when other relevant factors are taken into account. However, when we concentrate on the last few years (from 1995 to 2001), when FDI boomed worldwide and negotiations for China's WTO membership accelerated, the "Chinese" effect becomes highly significant. Assessing the impact country by country, China's inward FDI appears to have hampered that of Mexico and Colombia.

Keywords: China, Latin America, FDI

JEL classification: F21, F3

¹ Both authors are affiliated with Banco de España. The opinions expressed are the authors' and not necessarily those of Banco de España. We would like to thank Juan Carlos Berganza, Luis Molina, José Manuel Montero, Daniel Navia, and Juan Ruiz for their clarifications on data and methodological issues. We are also grateful for suggestions from participants to the First LAEBA Conference on the Challenges and Opportunities of the Emergence of China and to a Banco de España seminar. Remaining errors are obviously our own. Contact author: alicia.garcia-herrero@bde.es. Remaining errors are obviously our own.

Introduction

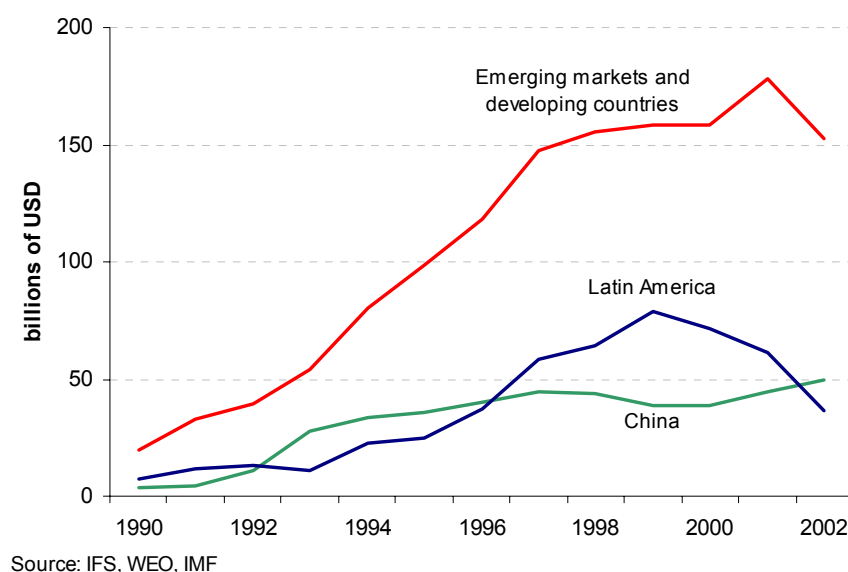
The rapid emergence of China as an important player of the global economy is a remarkable issue with consequences for the rest of the world. An important aspect is foreign direct investment (FDI) since China has been attracting a growing share of FDI flows since 1990s. After receiving an average of \$28 billion in the 1990s, China's annual FDI inflows have increased to \$47 billion on average since WTO membership in 2001² (Graph 1) and have continued to grow until reaching the third largest stock of FDI after the US and the UK. Foreign firms are attracted by China's rapid economic growth; increasing demand for consumer goods; a skilled and educated workforce, at least in the coastal area; improved infrastructure; and a more predictable business environment. Since the early 1980s, China has drawn significant investment from regional conglomerates in Hong Kong, Taiwan, Macao and Singapore, but also from the largest industrial economies, particularly Japan and the US.

Many countries, especially developing ones, fear that FDI may be diverted away from them into China, in addition to luring their domestic investors away from home. FDI is very important for Latin America since it has been the major source of external financing in the last few years and has also helped modernize the economic structure. Nonetheless, FDI flows to Latin America have started to fall since 2000, before and more abruptly than FDI flows to emerging markets (Graph 1). This is why understanding what might be the impact of China on Latin American FDI seems particularly relevant for policy makers in the region.

Whether external financing is diverted from Latin American countries into China will depend on a number of different factors. A first one is the degree of integration of capital markets. If capital markets are not fully integrated across countries – or, more likely, regions – an increase in Chinese inward FDI will not necessarily imply a reduction in FDI to another country or region. The large regional FDI flows in Asia would seem to be the case. In fact, Hong Kong, Taiwan, Macao and Singapore have been the main suppliers of FDI to China while practically irrelevant for other parts of the world, including Latin America.

² These figures are drawn from IMF International Financial Statistics.

Graph 1. FDI Net Inflows



A second aspect is the impact of Chinese inward FDI on worldwide FDI flows. If foreign direct investors reap large benefits from their presence in this country, or there are spillovers in other countries, more savings may be converted into FDI also in other parts of the world. In the same vein, China's contribution to raising the rate of return of FDI could twist investors' preference towards FDI instead of other private capital flows (mainly portfolio or cross-border lending), if their returns were uncorrelated with those of FDI.

A third aspect is the nature of Chinese inward FDI. If oriented towards exports, it might reduce FDI in other countries which compete in the same export markets. This will be less so if FDI is oriented towards China's domestic demand. In addition, if FDI increases substantially Chinese imports, it might foster FDI to other countries which are suppliers of Chinese imports. This will be particularly the case for exporters of commodities, which China is scarce of.

It seems, thus, clear that the impact of Chinese inward FDI on Latin American countries is an empirical question, which has hardly been explored yet. A first step –even if only descriptive – is found in a recent publication by the IADB (2004). The report depicts the evolution of cumulative bilateral FDI flows to Latin America and to China and calculates a coincidence index in FDI home countries, which appears to be low between

the two areas. In addition, Chantasawat et al. (2004) analyze empirically whether China is taking FDI away from other Asian and Latin American countries. They find that the level of Chinese inward FDI is positively related to other Asian economies' inward FDI and that there is practically no impact on Latin American countries. They also conduct the same exercise on the shares of FDI where they do show a negative Chinese effect on the Asian and Latin American shares.

In our paper, we continue with the empirical approach and go beyond Chantasawat et al. (2004) in a number of ways. First, we use bilateral (home-host) data and not aggregate one. Bilateral data describes much better investor's behaviour, avoids a potential aggregation bias and limits collinearity problems. Second, we not only estimate the impact of Chinese inward FDI on Latin America as a whole, but also differentiate among countries since their productive structure and the type of FDI they attract is very different. For instance, Mexico and Central America have mainly received export-oriented FDI while South America has attracted FDI into the non tradable sector (mainly financial services and utilities) and the extraction of natural resources. We would, therefore, expect China to have a negative impact on the first group of countries but not on the second. In the latter case, it could even turn positive as China steps up its demand for commodities. Third, we do not assume that the supply of FDI is inelastic, which is quite a restrictive assumption for emerging countries. We do so by introducing other capital flows as an additional regressor, so as to capture potential substitution or complementarities among flows. Fourth, we take into account the adjustment cost of FDI, which is known to be relevant for this kind of capital flow. Fifth, we improve on the econometric technique to take better account of endogeneity. The generalized method of moments is used, instrumenting those potentially endogenous variables with lags, exogenous variables and other valid instruments, in order to obtain unbiased estimators and as efficient as possible. Finally, we compare different time spans, so as to assess whether China's impact on other countries inward FDI is a recent phenomenon, linked to the negotiations and final participation in the WTO, or started already after China started to open up its economy at the end of the 1970s.

This paper is organized as follows: section 2 reviews the literature of FDI determinants; section 3 describes the dataset, the variables included, their sources and the a-priori on

their relation with Latin American inward FDI; section 4 sets out our econometric strategy and its advantages and caveats; section 5 reviews the results; and section 6 draws the main conclusions and policy implications.

1. Determinants of FDI

A wealth of empirical literature has analyzed which are the main determinants of inward FDI and very little consensus exists.³ For a long time, the general view was that the “better” a country, in terms of its macroeconomic situation and institutional environment, the more easily it would attract FDI. Hausmann (2001) challenges this view since he finds evidence that poor-performers tend to attract more FDI as a share of total private capital flows. For example, countries with a low GDP per capita and more macroeconomic instability tend to have a larger share of FDI. On the other hand, several authors have found that the size of the host country, measured by GDP per capita or total GDP contributes to more FDI (Moore, 1993 and Love and Lage-Hidalgo, 2000). Hausmann (2001) also shows evidence that countries with poorer institutions tend to attract more FDI. Instead, a number of papers find the opposite. For example, Hines (1995) and Wei (1997) show that corruption discourages FDI, and the same is true for poor business operating conditions (Singh and Jun, 1995) and the inability to repatriate profits (Mody, Dasgupta and Singha, 1998). In the same vein, a survey conducted to over 1000 chief executives of multinational enterprises concludes that macroeconomic and political stability, as well as the regulatory environment and country size are keys for foreign direct investors to decide where to locate (AT Kerney, 2003). Another variable for which there is clearly no consensus is human capital. While it generally helps increase the marginal productivity of capital, this might not be the case in low-skill labour intensive countries where FDI is mostly attracted by low salaries (Chantasawat, 2003).

Another strand of the literature has concentrated on the relation between trade and FDI (Breinard 1997). Some find evidence of a substitution effect between the two while others argue in favour of complementarities because of the export propensity of foreign

³ Reviewing the reasons behind the lack of consensus is beyond the scope of this paper but two very important ones are the lack of reliable data (Singh and Jun, 1995) and the difference between horizontal and vertical FDI (Ewe-Ghee Lim, 2001).

firms (Chen, 1994). In addition, openness to trade also appears to be a relevant determinant of FDI (Singh and Jun, 1995 and Albuquerque, Loyza and Servén, 2002).

Finally, some authors have concentrated on the role of push factors, either home country or global ones although there is no clear consensus on which ones are key. Albuquerque, Loyza and Servén (2002) report that push factors explain more than 50% of FDI developments. In the same vein, Levy-Yeyati, Panizza and Stein (2002) show that the economic cycle in industrial countries is a relevant determinant of FDI but the direction of influences changes for the US, Japan and Europe.

2. Variables and data issues

Our dependent variables are annual bilateral inward FDI flows from the different OECD countries (home) towards the six largest economies of Latin America (host), expressed in millions of US dollars. These are Argentina, Brazil, Chile, Colombia, Mexico and Venezuela (the full list of home and host countries is shown in Table A-1). The data is drawn from the OECD's International Direct Investment Statistics (Table A-2 gives details on the data sources).

We have followed two alternatives time horizons. The longest possible ones, given data availability, which starts close to China's decision to conduct an "open door" policy, namely from 1984 until 2001. This yields an unbalanced panel of 2850 observations of bilateral FDI flows. Nonetheless, due to the missing values in the explanatory variables, this first model is estimated with a maximum of 527 observations⁴. Second, since the pattern of FDI flows appears to have changed since the mid-1990s, we estimate a shorter panel, from 1995 to 2001. This period should also capture foreign direct investors' behaviour in the light of China's negotiations for WTO membership. In this case, we only have a maximum of 428 observations in the estimations.

Our objective variable is the bilateral inward FDI flow from different OECD countries to China. If there were a substitution effect from Latin American inward FDI towards

⁴ This is the number of observations in the restricted model (after eliminating jointly non-significant parameters). In the general model the number of observations is lower, 339, because of the existence of missing values in the not-significant regressors.

China, the sign of this coefficient would be negative. The data is drawn from the same OECD source as the dependent variable. This implies that our data excludes important suppliers of FDI to China, which find themselves in the Asian region and outside the OECD. In reality, it is hard to think of a potential competition between China and Latin America for FDI from Asian countries such as Hong Kong, Macao, Taiwan or Singapore. In other words, for Asian non-OECD countries, there does seem to be a fragmentation in the FDI market. Including these countries as FDI providers could actually distort the answer to the question we pose ourselves, namely whether countries potentially interested in both areas (Latin America and China) have reduced their FDI in Latin America because of China.

For robustness, we also include bilateral inward FDI to Hong Kong since a lot of reinvesting takes place between the two economies. In addition, we conduct robustness tests summing Chinese and Hongkonese inward FDI.

The other potentially relevant determinants of FDI, which we include as control variables, are classified into: (i) capital flows, (ii) bilateral variables, (iii) host country factors, (iv) home country variables and (v) global factors

The model estimated could be expressed as follows:

$$\begin{aligned}
 FDI_{j,t}^i = & \lambda + \gamma \times FDI_{j,t-1}^i + \eta_1 \times FDI_{China,t}^j + \sum \alpha \times \text{capital flows}_t \\
 & + \sum \beta \times \text{bilateral factors}_t + \sum \chi \times \text{host factors}_t + \sum \delta \times \text{home factors}_t \\
 & + \sum \phi \times \text{global factors}_t + \varepsilon_{j,t}^i
 \end{aligned}$$

i = host country (Latin America)

j = home country (OCDE)

As for **capital flows**, we include developments in other capital flows (namely portfolio and cross-border) so as to control for the substitution between different types of flows. If so, the coefficient would have to be negative and significant. This data are drawn from the IMF International Financial Statistics (IFS). We also control for the lag of the dependent variable because FDI flows are likely to require time to adjust to desired levels, implying a certain degree of persistence. Another important issue is that FDI decisions tend to be influenced by what competitors do. To take this into account, we

include FDI from the whole OECD to Latin America, as well as to China and Hong Kong. If the coefficients were significant and positive, they would show some kind of herd behaviour of foreign direct investors or, at least, some externalities from following other investors. We also consider the possibility that investment decisions are taken at a regional level. In other words, that the fact that a country has FDI in, say, Chile contributes to its investing in other Latin American countries. In the same vein, we introduce FDI to OECD countries to test whether a possible preference of foreign direct investors to be present only in industrial countries discourages FDI to Latin America. Finally, we control for global trends in FDI flows. This is because it will certainly be easier for Latin American countries to receive FDI in boom years and not the other way around. All these variables are drawn from the abovementioned OECD database.

As **bilateral** factors, we include the bilateral nominal exchange rate since it affects the cost of the investment – if paid in local currency - but also the value of repatriated profits. A depreciation of the host country currency against the home country one should, thus, reduce the cost of the investment but also profits repatriated. An increase in this variable implies a depreciation of the host currency against the home one and is drawn from the IFS. We add the differential in profitability, measured by the difference in the short-term interest rate between the host and the home country, and drawn from the IFS. The coefficient of this variable should be positive if FDI decisions are taken on the basis of short-term profitability. For longer-term profitability, economic growth in the host country is probably a better indicator. In addition, we consider bilateral exports and imports from the Direction of Trade Statistics database of the IMF. This allows us to control for the substitutability/complementarity between exports/imports and inward FDI. Finally, we include an index of the similarity in production structure between the home and the host countries, based on two-digit manufactured value added data from UNIDO.⁵

⁵ The construction of this measure of economic similarity follows García-Herrero and Ruiz (2004). It is expressed as

$$S_{j,i,t} = -\sum_{n=1}^N |s_{n,j,t} - s_{n,i,t}|$$

where N is the number of sectors. Note that $S_{i,j,t}$ represents the average of discrepancies in economic structures in the period t. $S_{i,j,t}$ might take values between 0 for identical structures and –2 for disjoint

There are a number of potentially relevant **host factors**. First, macroeconomic conditions related to the external sector, such as the level of external debt to GDP, the debt service, external reserves and export growth. The first two should, in principle, bear a negative relation with inward FDI while the last two, particularly the latter, should be positively related. Other macroeconomic conditions are GDP growth, the level of domestic investment to GDP, and the fiscal balance, whose coefficients should in principle, be positive. Finally, inflation and the real exchange rate may be expected to reduce inward FDI in as far as they reduce the host country's competitiveness. All these variables are drawn from the IFS and World Bank statistics.

Other relevant host factors are the size of the country, which we proxy by a combination of GDP per capita and GDP both in US dollars⁶, and its endowment of natural resources drawn from Hausmann (2001). Both should, in principle, contribute to higher FDI. We also take a few host country institutional characteristics although we have to limit ourselves to those with time variant data because of the econometric methodology followed. These are capital account restrictions, drawn from the Milesi-Ferretti database, the quality of creditor rights from the International Country Risk Guide database, and the literacy level proxying human capital, from the World Bank. The first should discourage capital flows, including FDI, and the last two should, in principle, yield a positive coefficient. However, as for macroeconomic variables, we should not forget Hausmann's evidence and the general lack of consensus for many variables.

Finally, other potentially relevant host country factors are financial crises. We include one dummy variable for each type of crisis, sovereign, currency or banking, which take the value of one in each year in which a country finds itself in a crisis. The variables are drawn from Díaz-Cassou, García-Herrero and Molina (2004)⁷. While we should generally expect crises to discourage foreign investors, it is also true that banking crises tend to be followed by the opening up of the banking system to foreign competition, mainly through privatization. This should in principle increase FDI.

productive structures. Therefore higher values for $S_{i,j,t}$ imply more similarity between the host and home productive structure.

⁶ We also control for both variables separately and the results do not change.

⁷ Since banking crises tend to extend over years, we also construct a different dummy for this type of crisis, which takes the value of one when the crisis erupts.

As for **home** county effects, we include GDP growth and GDP per capita, from WEO database. Finally, the type of **global** shocks considered are related to developments in oil prices, which are drawn from Datastream. Table A-3 shows bilateral correlation between all these regressors.

3. Empirical methodology

Given the paper's objective, determining in the most accurate way whether China's inward FDI affects Latin America's one, we face one major challenge: endogeneity. Endogeneity could lead to a biased coefficient of our objective variable (Chinese inward FDI). The other challenges, generally found in the empirical FDI literature, are how to deal with adjustment costs, unobserved heterogeneity and the choice of the controls not to lose too many degrees of freedom but avoid a missing variable problem. To tackle the endogeneity, but also the existence of adjustment costs and unobserved heterogeneity, we use the Generalized Method of Moments (GMM), following Arellano and Bover (1995).

We prefer this option to a fixed-effects estimator for several reasons. First, it allows us to take into account unobserved time-invariant country-specific effects. Second, we can tackle the potential endogeneity arising from the inclusion of the lagged dependent variable (to capture the adjustment costs) and other endogenous variables (for instance, the FDI to Latin American countries), as well as that stemming from other right-hand side variables, particularly other FDI flows and bilateral trade. Third, it allows us to deal with the possibility that the dependent variable is not stationary. Finally, we achieve a high degree of efficiency by considering all possible instruments.

The Arellano-Bover estimator, or the GMM system estimator, combines the regression expressed in first differences (lagged values of the variables in levels are used as instruments) with the original equation expressed in levels (this equation is instrumented with lagged differences of the variables) and allows to include some

additional instruments⁸. The disadvantage with the GMM estimators, whose properties hold asymptotically, is the relatively small number of observations in relation to the moment conditions. As a robustness test, we run all regressions as a fixed-effect panel, with robust standard errors. The results do not differ too much. The other disadvantage is that we cannot include time-invariant regressors since their coefficients cannot be identified through this methodology. However, this does not imply that there is a problem of omitted variables since they are all included in the time-invariant country-specific effects.

In any event, we do tackle any potential omitted variable problem in an additional way. We, first estimate a general equation incorporating all control variables considered (column (1) of Tables 1 and 2). We, then, test – through a Wald test – the joint hypothesis that coefficients of the variables that are not significant individually are equal to zero. If not rejected, we re-estimate the model only with the controls which were significant in the general regression. Otherwise, we test a less restrictive hypothesis but still trying to reduce the number of regressors to the maximum extent possible. This is a recursive strategy, from general to specific⁹, which we follow until we can not accept that the remaining set of coefficients of the control variables is equal to zero (Column (2) of Tables 1 and 2). If these hypotheses are true, we achieve more efficient coefficients of the remaining parameters, including that of the variable of interest, Chinese inward FDI. The last model, apart from incorporating these restrictions on the regressors included, tests whether the effect of Chinese inward FDI is different across Latin American countries (Column (3) of Tables 1 and 2).

4. Results

As previously described, we regress the six largest Latin American countries' inward FDI on bilateral FDI to China and control for the aforementioned regressors.

⁸ In all the estimations we present results for a Sargan test of over-identifying restrictions that checks the overall validity of the different moment conditions and in all the cases we fail to reject the null hypothesis.

⁹ We follow the general-to-specific modelling approach. It seeks to mimic reduction by commencing from a general congruent specification that is simplified to a minimal representation consistent with the desired criteria and the data evidence. (Hendry, 2000).

As a first step, we use our whole sample from 1984 to 2001. This captures developments shortly after China started its open door policy until the most recent data, namely China's entry into WTO. When all controls are introduced, we find no evidence of a substitution effect from Latin American FDI to China (Table 1, column 1). The same is true for FDI to Hong Kong. However, the similarity of the economic structure between Latin American countries and China is significant and with the expected sign: the closer the economic structure the less inward FDI to Latin America. This result, however, is lost in the restricted model, which stems from eliminating the parameters which are jointly nonsignificant and equal to zero (Table 1, column 2).

We also look into the impact of China on the inward FDI of each of the Latin American countries considered. Argentina and Colombia seem to be negatively affected but the parameters are small. In addition, we cannot reject the hypothesis that the coefficients of each Latin American country are the same and equal to zero (Table 1, column 3). Given the weakness of Argentina and Colombia's results, we can generally conclude that there is practically no "Chinese effect" on Latin American inward FDI in this long time span.

As regards the control variables, we find a strong complementarity effect between FDI and other private capital flows, which is not observed in the unrestricted model. There is also a clear regional impact so that foreign director investors to a certain Latin American country tend to invest in other countries of the region as well. This result is maintained in three specifications. The coefficient of bilateral exports is also significant, with a positive sign. This result, which is maintained in all three specifications, supports the hypothesis of complementarities – and not substitution – between FDI and trade. Finally, and interestingly, the occurrence of banking crises appears to foster FDI in all three specifications. This is in line with the countries tend to open up to foreign competition as a consequence of a banking crisis and could also be read as privatizations having some role in explain FDI in as far as most bank purchases by foreign investors were done in the context of a privatization process.¹⁰

There are a number of significant variables in the first specification with all regressors, which become nonsignificant in the restricted ones. These are the bilateral exchange

¹⁰ The fact that this result is only found for the dummy which considers all crisis years, and not only the burst of the crisis, supports this interpretation.

rate, the debt service and GDP growth in the host country.¹¹ On the other hand, the availability of natural resources in the host countries becomes significant and with the expected – positive – sign.

In a second exercise, we restrict the panel to a more recent time span, from 1995 to 2001. Apart from the fact that there may have been a structural change in the evolution of FDI since the mid-1990s, another reason to split the sample in this way is that China accelerated its negotiations for WTO membership in this period, until it finally entered the club in 2001. In this more recent time span, the effect of Chinese inward FDI on FDI to Latin America is clearly negative and significant (Table 2, column 1 and 2).

When analyzing the impact country by country, Mexico and Colombia are the two countries for which Chinese inward FDI reduces FDI inflows in a significant way¹², particularly in the case of Mexico at a 99% confidence level (95% for Colombia). As Table 2 shows, when Chinese inward FDI increases by \$100 million, Colombian and Mexican inward FDI is reduced by \$84 and \$29 million, respectively. It should be noted, though, that notwithstanding the relatively large difference in the parameters, we cannot reject the hypothesis that both coefficients are statistically equal. This result is particularly interesting in the case of Mexico since its free trade agreement with the US (NAFTA) was in place during the whole time span in this case. In fact, inward FDI generally increased during our sample – and has only started to fall more recently – but this does not imply that China had no effect. Our results should be read in terms of a counterfactual: Had Chinese inward FDI not been so strong, Mexico could have attracted more FDI than it actually did.

Results for control variables are very similar to the longer panel except for two. The bilateral exchange depreciation is now clearly significant in increasing FDI to Latin American countries, which hints to the fact that a lower investment cost, because of the exchange rate depreciation, weighs more than a reduction in repatriated benefits. In addition, larger bilateral imports seem to imply less Latin American inward FDI. This result is in line with the hypothesis of substitution between imports and FDI (i.e., that

¹¹ The fact that these variables are non-significant may be due to the increase in the number of observations after restricting the model.

¹² We can not reject that coefficients of Argentina, Brazil, Chile and Venezuela are the same and equal to 0. Therefore, the effect of FDI to China is non significant on these countries.

FDI is oriented towards domestic demand) as opposed to the complementary of exports and FDI.

Finally, we conduct a number of tests to check the robustness of our results. The first one tackles the close relation between Hong Kong's and Chinese inward FDI. We, thus, take as objective variable the sum of FDI to China and Hong Kong and the results do not change. We also run the regressions taking logs for all variables for which this is possible. The results are very similar.

Table 1. Results for long time span. Sample 1984-2001

	(1)		(2)		(3)	
	<i>No restrictions</i>		<i>Jointly insignificant coefficients removed</i>		<i>(2) + Individual effect for each Latin America country</i>	
Dependent variable: Bilateral FDI flow from home to host	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
<i>Objective variables</i>						
<i>Latin America as whole</i>						
<i>Bilateral FDI to China</i>	-0,068	(0,234)	-0,062	(0,245)		
<i>Bilateral FDI to Hong Kong</i>	-0,033	(0,574)				
<i>Country specific ¹</i>						
Impact on FDI to China on FDI to Argentina					-0,095**	(0,043)
Impact on FDI to China on FDI to Brazil					-0,131	(0,383)
Impact on FDI to China on FDI to Chile					0,075	(0,489)
Impact on FDI to China on FDI to Colombia					-0,228*	(0,091)
Impact on FDI to China on FDI to Mexico					-0,068	(0,295)
Impact on FDI to China on FDI to Venezuela					-0,062	(0,487)
<i>Control variables</i>						
<i>Capital flows</i>						
Total capital flows over GDP	-16,535	(0,163)	9,357***	(0,002)	8,775***	(0,002)
<i>Lag of Bilateral FDI</i>	0,259	(0,258)	0,221	(0,172)	0,312	(0,140)
OECD FDI to China	0,003	(0,329)				
OECD FDI to Hong Kong	0,006	(0,398)				
OECD FDI to Latin America	-0,001	(0,308)				
Total FDI of OECD countries	0,000	(0,448)				
<i>Bilateral FDI to Latin America</i>	0,061***	(0,002)	0,060***	(0,004)	0,051***	(0,003)
<i>Bilateral FDI to OECD</i>	0,002	(0,156)	0,001	(0,149)	0,001	(0,118)
<i>Bilateral variables</i>						
Bilateral exchange rate (increase depreciation of host currency)	0,398**	(0,018)	0,082	(0,134)	0,099*	(0,067)
Host home interest rate differential	0,164	(0,414)				
<i>Exports</i>	0,074**	(0,012)	0,038***	(0,007)	0,037***	(0,007)
<i>Imports</i>	-0,029	(0,409)				
Similarity in productive structure	36,881	(0,808)	94,095	(0,258)	91,405	(0,256)
<i>Host country variables</i>						
<i>Macro variables</i>						
External Debt to GDP	-4,335	(0,571)				
Debt service to GDP	-95,210**	(0,018)				
External Reserves	-0,012	(0,280)				
Export growth	-1,772	(0,620)				
GDP growth	40,084**	(0,024)	7,707	(0,162)	6,507	(0,205)
Inflation	-0,592	(0,225)				
Fiscal balance	-17,023	(0,384)				
Domestic Investment over GDP	-18,733	(0,199)				
Real Effective Exchange Rate	-0,831	(0,495)				
<i>General characteristics</i>						
Size	0,000	(0,540)				
Natural Resources	1,045**	(0,043)	0,221**	(0,049)	0,216*	(0,055)
<i>Institutional characteristics</i>						
Capital account restrictions	166,729	(0,372)				
Creditor rights	32,538	(0,583)				
Literacy	81,430	(0,243)	15,644	(0,150)	13,752	(0,149)
<i>Occurrence of Crises</i>						
Sovereign crisis	-94,170	(0,448)				
Banking crisis	459,129***	(0,007)	147,731***	(0,009)	135,266**	(0,010)
Currency crisis	-157,281	(0,232)				
<i>Home country variables</i>						
GDP growth in home country	-31,985	(0,138)	-4,837	(0,219)	-3,288	(0,334)
GDP per capita in home country	0,000	(0,957)				
<i>Global shocks</i>						
Oil price	6,699	(0,701)				
<i>Constant</i>	-7153,329	(0,246)	-1707,054	(0,114)	-1520,144	(0,112)
F-statistic	42678,81	(0,000)	497,36	(0,000)	1430,84	(0,000)
Observations	339		527		527	
Number of groups (home host)	65		87		87	
Sample	1984-2001					
Robust p values in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						
Variables in Italic are instrumented through the GMM procedure following Arellano and Bover (1995)						
Variables removed in columns (2) and (3) are jointly not significant at a 95% confidence interval.						
There are also included as regressors the categoriacal variables <i>rating</i> and <i>civil and political liberties</i>						
¹ These variables result from multiplying FDI to China and a dummy variable which takes the value of 1 for the observations of each of the host countries						

Table 2. Results for shorter time span. Sample 1995-2001

	(1)		(2)		(3)	
	No restrictions		Jointly insignificant coefficients removed		(2) + Individual effect for each Latin America country	
Dependent variable: Bilateral FDI flow from home to host	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Objective variables						
Latin America as whole						
Bilateral FDI to China	-0.154*	(0,065)	-0.157**	(0,024)		
Bilateral FDI to Hong Kong	-0,084	(0,299)				
Country specific ¹						
Impact on FDI to China on FDI to Argentina					-0,083	(0,244)
Impact on FDI to China on FDI to Brazil					-0,219	(0,260)
Impact on FDI to China on FDI to Chile					0,035	(0,737)
Impact on FDI to China on FDI to Colombia					-0.844**	(0,013)
Impact on FDI to China on FDI to Mexico					-0.287***	(0,007)
Impact on FDI to China on FDI to Venezuela					-0,204	(0,230)
Control variables						
Capital flows						
Total capital flows over GDP	42.349**	(0,034)	9,168	(0,193)	7,464	(0,296)
Lag of Bilateral FDI	0,031	(0,877)	0,046	(0,259)	0.064*	(0,055)
OECD FDI to China	-0,002	(0,430)				
OECD FDI to Hong Kong	0.023**	(0,018)				
OECD FDI to Latin America	-0.004**	(0,013)				
Total FDI of OECD countries	0,000	(0,379)				
Bilateral FDI to Latin America	0.086***	(0,004)	0.121***	(0,001)	0.108***	(0,001)
Bilateral FDI to OECD	0,001	(0,177)				
Bilateral variables						
Bilateral exchange rate (increase depreciation of host currency)	0.621**	(0,020)	0.179**	(0,045)	0.276***	(0,008)
Host home interest rate differential	-3,149	(0,158)				
Exports	0.203***	(0,001)	0.247***	(0,000)	0.250***	(0,002)
Imports	-0.121**	(0,033)	-0.168***	(0,003)	-0.167**	(0,011)
Similarity in productive structure	97,138	(0,682)				
Host country variables						
Macro variables						
External Debt to GDP	-3,307	(0,667)				
Debt service to GDP	122.735**	(0,043)				
External Reserves	-0,019	(0,130)	-0,007	(0,151)	-0,005	(0,250)
Export growth	5,459	(0,374)				
GDP growth	-33,646	(0,260)				
Inflation	8,161	(0,165)				
Fiscal balance	-94,879	(0,170)				
Domestic Investment over GDP	29,968	(0,507)				
Real Effective Exchange Rate	-1,911	(0,530)				
General characteristics						
Size	0,000	(0,450)				
Natural Resources	1.702**	(0,044)	0.677**	(0,022)	0.621**	(0,032)
Institutional characteristics						
Capital account restrictions						
Creditor rights	47,222	(0,410)				
Literacy	193.501**	(0,026)	46.056*	(0,085)	35,217	(0,189)
Occurrence of Crises						
Sovereign crisis	-195,527	(0,347)				
Banking crisis	-398,843	(0,128)	222.233***	(0,000)	217.170***	(0,001)
Currency crisis	53,805	(0,773)				
Home country variables						
GDP growth in home country	-7,787	(0,702)				
GDP per capita in home country	0,007	(0,260)				
Constant	-20,930.168**	(0,026)	-4,928.704*	(0,062)	-3882,54	(0,138)
F-statistic	6425,51	(0,000)	338,92	(0,000)	291,51	(0,000)
Observations	172		428		428	
Number of group (home host)	60		99		99	
Sample	1995-2001					

Robust p values in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Variables in Italic are instrumented through the GMM procedure following Arellano and Bover (1995)
Variables removed in columns (2) and (3) are jointly not significant at a 95% confidence interval.

¹ These variables result from multiplying FDI to China and a dummy variable which takes the value of 1 for the observations of each of the host countries

5. Conclusions

In this paper we investigate how Chinese inward FDI affects FDI flows to Latin American countries. Over a long time span, from 1984 to 2001, we hardly find any evidence of FDI dislocation from Latin American countries to China but it seems to be present in a more recent time span, which focus on the years when FDI flows grew more rapidly worldwide and negotiations for China's WTO membership accelerated (from 1995 to 2001). This is particularly significant in the case of Mexico and, slightly less so, for Colombia. Given that FDI generally increased during the period considered, these results should be read in terms of the counterfactual: Had Chinese inward FDI not been so strong, these countries could have attracted more FDI.

If we think of the previously mentioned different FDI structure across Latin American countries, our finding seems to suggest that competing in the same sectors as China increases the likelihood of a substitution of FDI. Having a cursory look at the sector structure of FDI in Mexico and Colombia, we find that manufacturing accounts for 56% of total in the case of Mexico (the largest of all sectors) and 21% in the case of Colombia (the largest after financial services). This is probably higher than in the other four Latin American countries included in the analysis where FDI generally concentrates on natural resources and services. In any event, these results should be taken with care since they are based on aggregate – albeit bilateral – data and not sector one. However, there is a choice to be made between sector and bilateral data. In addition, our analysis would benefit from an extension in which the possible reasons for the impact of Chinese inward FDI on that of Latin America is tested for. Such reasons could include the economic and/or export structure, the role of privatizations, differences in taxes and/or wages and, more generally, differences in competitiveness.

When looking into the future, there are reasons to expect that China will continue to receive large amounts of FDI, and perhaps even increase them: the country is bound to embark in a large privatization process, which has already been announced for some sectors, such as the banking system. In addition, the wage differential with Latin American countries will probably be maintained for quite some time given China's large – close to infinite – elasticity of labour supply. Finally, even if wages increase

substantially, it will be along with purchasing power for a very large population. This will make China a particularly attractive country for FDI interested in domestic demand.

This scenario, where China continues to attract a large share of world FDI, may seem worrisome for Latin American countries, particularly those with a more similar productive structure to that of China. However, it only reflects one side of the coin. At the same time, it provides tremendous opportunities in the medium term. Due to geographical reasons, Latin American countries are not in such good position as Asian economies to reap some of these benefits, such as assembling and re-exporting of manufactured products. However, they will clearly benefit from China's increasing demand for raw materials in a scenario where China continues to grow fast. This is not only true for Latin American exports but also for inward FDI in sectors related to raw materials. To this end, the opening of these sectors to foreign investors is a precondition to reap these benefits.

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Appendix: List of Tables

Table A - 1. List of countries considered

Home country	Host country	Additional countries or areas
Australia	Argentina	China
Austria	Brazil	Hong Kong
Belgium	Chile	Latin America
Canada	Colombia	OECD
Czech Republic	Mexico	World
Denmark	Venezuela	
Finland		
France		
Germany		
Greece		
Hungary		
Iceland		
Ireland		
Italy		
Japan		
Korea		
Mexico		
Netherlands		
New Zealand		
Norway		
Poland		
Portugal		
Slovak Republic		
Spain		
Sweden		
Switzerland		
Turkey		
United Kingdom		
United States		

Table A - 2. Variables and data sources

Variable type	Name	Description	Units	Source
	Bilateral FDI	Bilateral FDI	Millions of USD	OECD
Bilateral	Bilateral exchange rate	Bilateral exchange rate. Increase implies depreciation in home currency	Host per home currency	IFS, IMF
Bilateral	Bilateral exports	Bilateral Export flows	Millions of USD	Direction of Trade Statistics, IMF
Bilateral	Bilateral imports	Bilateral Import flows	Millions of USD	Direction of Trade Statistics, IMF
Bilateral	Host home interest rate differential	Host home differential in short term interest rates	Percentage	IFS, IMF
Bilateral	Similarity in productive structure		Index	UNIDO
Capital flows	Bilateral FDI to China	Level of FDI flows of each home country in China	Millions of USD	OECD
Capital flows	Bilateral FDI to Hong Kong	Level of FDI flows of each home country in Hong Kong	Millions of USD	OECD
Capital flows	Bilateral FDI to Latin America	Level of FDI flows of each home country in the six Latin American countries included	Millions of USD	OECD
Capital flows	Bilateral FDI to OECD	Level of FDI flows of each home country in OECD	Millions of USD	OECD
Capital flows	OECD FDI into OECD	FDI of all OECD's countries in OECD area	Millions of USD	OECD
Capital flows	OECD FDI to China	Level of FDI of all OECD's countries in China	Millions of USD	OECD
Capital flows	OECD FDI to Hong Kong	FDI of all OECD's countries in Hong Kong	Millions of USD	OECD
Capital flows	OECD FDI to Latin America	Level of FDI of all OECD's countries in Latin America	Millions of USD	OECD
Capital flows	Total FDI of OECD countries	FDI of all OECD's countries in the world	Millions of USD	OECD
Global	Oil Price	Brent Crude	Current Month, fob USD/BBL	Datastream
Home	GDP growth in home country	Gross domestic product at constant prices	Percentage	WEO, IMF
Home	GDP per capita in home country	Gross domestic product per capita, current prices	US dollars	WEO, IMF
Host	Capital account restrictions	Dummy: 1 if the country had capital account restrictions. 0 Otherwise		Milesi-Ferretti (1998)
Host	Creditor rights	Contract Viability, Profits Repatriation, Payment Delays		PRS Group
Host	Debt service to GDP	Interest expenditures plus amortizations	Percentage of GDP	World Bank
Host	Domestic Investment over GDP	Fixed capital investment	Percentage of GDP	World Bank
Host	Export growth	Annual growth in exports in USD	Percentage	World Bank
Host	External Debt to GDP	Total external debt	Percentage of GDP	World Bank
Host	External Reserves	Total reserves minus gold	Millions USD	IFS, IMF
Host	Fiscal balance	Public sector balance (positive indicates surplus and negative deficit)	Percentage of GDP	IFS, IMF
Host	GDP growth	Real GDP annual growth rate	Percentage	IFS, IMF
Host	Inflation	CPI annual growth rate	Percentage	IFS, IMF
Host	Literacy	Adult Literacy raten (% of people older than fifteen)	Percentage	World Bank
Host	Natural Resources	Natural resources valuation	Millions of USD (PPP)	Hausmann (2001)
Host	Occurrence of banking crisis	Dummy. 1 if the country has undergone a banking crisis in a certain year.		Diaz, García-Herrero and Molina (2004)
Host	Occurrence of exchange crisis	Dummy. 1 if the country has undergone a currency crisis in a certain year.		Diaz, García-Herrero and Molina (2004)
Host	Occurrence of sovereign crisis	Dummy. 1 if the country has been under default in that year.		Diaz, García-Herrero and Molina (2004)
Host	Other capital flows over GDP	Portfolio and other foreign investment flows	Percentage of GDP	IFS, IMF
Host	Political and social liberties	Political and social freedom. 0 more freedom	Categorical	Freedom House
Host	Rating	Sovereign debt risk rating	Categorical	Moody's
Host	Real Effective Exchange Rate	Real Effective Exchange Rates (an increase indicates an appreciation)	Index	IFS, IMF
Host	Short term Interest rate		Percentage	IFS, IMF
Host	Size	Product of GDP per capita and total GDP		WEO, IMF

Table A - 3. Correlation among variables

	Bilateral FDI to China	Bilateral FDI to Hong Kong	Bilateral FDI to Latin America	Bilateral FDI to OECD	Bilateral exports	Bilateral imports	OECD FDI to China	OECD FDI to Hong Kong	OECD FDI to Latin America	Total FDI of OECD countries	External Debt to GDP	External Reserves	Export growth	GDP growth	Size	Inflation	Fiscal balance	Debt service to GDP	Natural Resources	Capital account restrictions	Total capital flows over GDP	Domestic Investment over GDP	Sovereign crises	Banking crises	Currency crises	Creditor rights	Similar productive structure	Home GDP growth	Home GDP per capita	Real Effective Exchange Rate	Bilateral exchange rate	Host home interest rate differential	Oil price
Bilateral FDI to China	1,00																																
Bilateral FDI to Hong Kong	0,44	1,00																															
Bilateral FDI to Latin America	0,34	0,55	1,00																														
Bilateral FDI to OECD	0,29	0,55	0,36	1,00																													
Bilateral exports	0,17	0,33	0,35	0,16	1,00																												
Bilateral imports	0,15	0,32	0,32	0,15	0,99	1,00																											
OECD FDI to China	0,23	0,06	0,13	0,19	0,05	0,04	1,00																										
OECD FDI to Hong Kong	0,11	0,11	0,18	0,30	0,07	0,05	0,75	1,00																									
OECD FDI to Latin America	0,09	0,09	0,22	0,35	0,07	0,06	0,71	0,90	1,00																								
Total FDI of OECD countries	0,03	0,07	0,19	0,39	0,06	0,06	0,52	0,75	0,89	1,00																							
External Debt to GDP	-0,06	-0,04	-0,06	-0,09	-0,06	-0,05	-0,28	-0,25	-0,21	-0,20	1,00																						
External Reserves	0,08	0,04	0,12	0,19	0,12	0,10	0,59	0,60	0,61	0,52	-0,35	1,00																					
Export growth	0,04	0,02	-0,01	0,04	0,01	0,01	0,08	0,06	-0,01	0,06	-0,08	-0,01	1,00																				
GDP growth	0,02	0,01	-0,01	-0,03	0,00	0,00	0,09	0,12	0,03	-0,05	-0,13	0,06	0,10	1,00																			
Size	0,06	0,04	0,10	0,18	0,15	0,12	0,48	0,54	0,55	0,48	-0,42	0,89	0,02	0,02	1,00																		
Inflation	-0,04	0,00	-0,03	-0,05	-0,02	-0,01	-0,14	-0,03	-0,08	-0,11	-0,05	-0,01	0,00	-0,17	0,07	1,00																	
Fiscal balance	0,02	0,00	0,00	0,00	0,00	-0,01	0,11	0,08	0,03	0,01	0,06	-0,07	0,10	0,18	-0,18	-0,21	1,00																
Debt service to GDP	-0,02	-0,01	0,01	0,03	0,01	0,01	-0,09	-0,08	0,00	0,07	0,69	-0,12	-0,08	-0,09	-0,20	-0,32	0,11	1,00															
Natural Resources	0,00	0,00	0,00	0,00	0,06	0,07	0,00	0,00	0,00	0,00	-0,25	0,46	0,02	-0,05	0,52	0,29	-0,53	-0,22	1,00														
Capital account restrictions	0,00	0,01	0,03	0,05	0,01	0,02	0,06	0,13	0,17	0,13	0,09	0,06	-0,18	0,04	0,02	0,09	-0,06	0,08	0,06	1,00													
Total capital flows over GDP	0,06	0,03	0,07	0,10	0,02	0,00	0,35	0,32	0,32	0,26	-0,50	0,27	-0,04	0,29	0,16	-0,34	0,29	-0,22	-0,20	-0,16	1,00												
Domestic Investment over GDP	0,05	0,03	0,00	-0,02	0,05	0,04	0,08	0,05	-0,02	-0,07	-0,34	0,06	0,10	0,40	0,07	-0,11	0,06	-0,16	0,04	-0,15	0,40	1,00											
Sovereign crises	-0,07	-0,04	-0,08	-0,15	-0,05	-0,03	-0,36	-0,32	-0,32	-0,35	0,40	-0,30	-0,12	-0,04	-0,20	0,36	-0,30	0,04	0,20	0,12	-0,56	-0,21	1,00										
Banking crises	0,03	-0,01	-0,03	-0,05	0,02	0,02	0,01	-0,16	-0,15	-0,13	0,19	0,11	-0,10	-0,21	0,11	0,16	-0,04	0,19	0,01	-0,08	-0,20	-0,14	-0,05	1,00									
Currency crises	-0,01	-0,01	0,01	0,01	-0,02	-0,02	-0,06	-0,11	0,04	0,03	0,29	-0,21	-0,02	-0,32	-0,11	0,08	-0,21	0,18	-0,06	0,09	-0,35	-0,25	0,19	0,30	1,00								
Creditor rights	0,01	0,02	0,04	0,05	0,08	0,07	0,19	0,32	0,28	0,17	-0,33	0,31	0,04	0,30	0,30	-0,18	0,34	-0,06	-0,10	-0,13	0,43	0,42	-0,35	-0,22	-0,29	1,00							
Similarity in productive structure	-0,09	-0,13	-0,07	-0,13	0,03	0,02	-0,03	-0,05	-0,11	-0,12	-0,24	0,22	0,07	0,02	0,39	0,17	-0,21	-0,24	0,37	-0,12	-0,01	0,12	0,02	0,00	-0,09	0,08	1,00						
GDP growth in home country	-0,06	0,05	0,08	0,04	0,00	0,01	0,15	0,14	0,17	0,16	0,06	0,07	0,10	0,01	0,07	0,00	-0,07	0,07	0,00	0,08	-0,05	-0,01	0,04	0,02	0,05	-0,10	-0,01	1,00					
GDP per capita in home country	0,41	0,28	0,20	0,31	0,15	0,13	0,38	0,44	0,42	0,34	-0,13	0,29	0,05	0,07	0,25	0,00	0,08	-0,06	0,00	0,07	0,15	0,02	-0,16	-0,09	0,00	0,15	-0,33	0,00	1,00				
Real Effective Exchange Rate	-0,13	-0,24	-0,17	-0,18	-0,06	-0,06	-0,15	-0,18	-0,18	-0,16	0,04	-0,12	0,01	-0,01	-0,11	0,02	-0,01	0,01	0,00	-0,03	-0,07	0,01	0,06	0,02	0,00	-0,06	0,13	-0,01	-0,28	1,00			
Bilateral exchange rate	-0,01	0,07	0,13	0,26	-0,03	-0,03	0,22	0,27	0,29	0,26	-0,07	-0,11	-0,02	0,04	-0,23	-0,13	0,06	0,02	-0,33	0,09	0,15	-0,05	-0,22	-0,19	0,06	-0,03	-0,21	0,02	0,18	-0,03	1,00		
Host home interest rate differential	-0,03	0,01	-0,02	-0,03	-0,01	0,00	-0,13	-0,03	-0,09	-0,08	0,02	-0,04	-0,05	-0,17	0,04	0,86	-0,15	-0,24	0,20	0,05	-0,30	-0,07	0,26	0,20	-0,04	-0,16	0,11	0,02	0,01	0,02	-0,09	1,00	
Oil price	-0,05	-0,02	-0,01	0,07	0,01	0,02	-0,21	-0,25	-0,17	0,12	0,01	-0,10	-0,05	-0,23	-0,07	-0,01	0,01	0,18	0,00	-0,04	-0,02	-0,28	0,04	0,21	-0,03	0,06	-0,03	-0,04	-0,15	0,03	-0,02	-0,03	1,00
Literacy	0,05	0,03	0,08	0,13	-0,03	-0,04	0,34	0,41	0,42	0,35	0,15	0,00	-0,05	0,03	-0,01	-0,10	0,46	0,07	-0,72	0,04	0,17	-0,10	-0,10	-0,01	0,06	0,22	-0,22	0,06	0,21	-0,09	0,17	-0,10	-0,10