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# Unravelling the Complex Motivations behind China's FDI

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## **Abstract**

We empirically investigate the factors that drive China's outward FDI using dynamic panel methods for 27 countries from 1995 to 2002. Based on the literature review we test three hypotheses: comparative advantages in low wage countries, vertical integration towards resource and human capital abundant countries, and the transaction-enforcing FDI to complement exports. Our results provide strong support for the transaction-enforcing motive: China's FDI follows exports. Next, only in the presence of exports, low income per capita is important arguably because low-income countries have a preference for Chinese low-cost exports. Finally, though this series we find no evidence of FDI to skill-abundant countries and no evidence that host market resources or governance matters.

**Keywords:** China, transaction-enforcing FDI, locational determinants

**JEL classification:** F21, F23, O16, O19, O53

## **I. Introduction**

In addition to attracting massive amounts FDI over time China has also become a major source of outward FDI. In 2005 FDI outflow from China amounted to U.S. \$12.3 billion (1.68 percent of the world total). By 2003 3,439 mainland Chinese enterprises had set up 7,470 companies in 139 countries. Of these firms, 27% are in manufacturing, 14% in commercial services, and 10% in wholesale and retail trade. Major overseas investors are listed below along with their foreign share of total assets in parentheses: China Ocean Shipping Group (31%), China National Cereal, Oils and Foodstuff Import and Export (42%), China National Chemicals Import and Export (40%), and China National Offshore Oil Corporation (27%). Many of the Chinese firms investing abroad are publicly owned, either by the state or by the provinces. However, limited liability firms from mainland China are increasingly engaged in outward FDI (UNCTAD 2003, 2004, 2005).

The purpose of this paper is to attempt to formulate an explanation for the rise in outward FDI from China. In general, there are two major theories about developing country FDI. First, outward FDI may follow a specific development path, increasing with the level of national income (e.g. see: Dunning et al. 1997). Second, and this is the focus of our research, FDI can be explained by host country characteristics. Heretofore the lion's share of the empirical literature deals with FDI from developed countries, and supports the thesis that horizontal FDI dominates because the market size of the host country is the most important determinant.<sup>1</sup> In contrast, there are only a few limited studies of the locational determinants of FDI from developing countries.<sup>2</sup> Explanations for this gap may be that developing countries are a heterogeneous group in which most countries have been less important players in cross-border investment, and that firms in developing countries are small so that the internationalization strategy is of limited importance to them. Or, that data on FDI from developing countries are less reliable.

In light of China's rising economic prowess we investigate the causal relation

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<sup>1</sup> See for example Culem (1988) for OECD countries, Lunn (1980) for the EU, Hines (1996) for the US, and many more recent papers.

between the dynamics of China's export markets and its FDI flows. In addition, we hope to draw some insights regarding the evolving pattern of China's foreign trade. Although still a developing country, China has rapidly become an important global investor. By studying China's FDI we hope to fill a more general gap by investigating what drives developing countries overseas investments. Our main conclusion is that we find strong support for the transaction-enforcing role of FDI. That is, Chinese firms mainly invest in countries to which they export.

In the present section we limit our discussion to four other studies on China's outward FDI that are relevant to our research. Liu et al. (2005) is part of the large empirical literature that analyzes the investment development path (IDP) of developing countries. They investigate how China's outward FDI is related to its internal economic development. Liu et al. show that FDI follows exports as a later stage of China's economic development. Their work focuses on the "push" determinants for FDI in the home country. In contrast our paper analyzes the pull factors in the host country. These and other papers adopt an individual time-series approach in which they regress the total outward FDI on the development of home country characteristics, including total exports. For a review of this literature see: Bajo-Rubio and Montero-Muño (2001).

Yang (2005) analyzes the outward FDI of China by using a network approach. In line with our empirical findings, he argues that Chinese firms try to build foreign networks to sell their products. As in our paper, he investigates the host country characteristics of China's FDI. However, in contrast to our paper his analysis is theoretical and descriptive. Overall, our empirical results are supportive to his findings in that we find an empirical relationship running from exports to FDI. Buckley et al. (2007) investigate the locational determinants of China's FDI more generally. The focus of their paper is on explaining the factors that drive FDI for separate historical eras, thereby giving insights in the external political priorities of different regimes. Although their study provides interesting correlations for a broad set of host country characteristics (including market size and exports), they do not consider causality and dynamics between exports and FDI, nor

<sup>2</sup> Exceptions are Pangarkar and Lim (2003) for Singapore and Erdilek (2003) for Turkey.

interaction with other factors. In contrast we find that market size does not matter without exports, which – together with the dynamics and other interaction terms – leads us to the conclusion that China’s FDI is predominantly transaction enforcing and not market seeking.

The remainder of the paper is set up as follows. In Part II we discuss the literature on FDI from developing countries to derive three hypotheses to explain the rise of FDI from China. Part III introduces the data and discusses the empirical issues. Part IV presents the results of the panel data estimation with special attention to the internal dynamics to disentangle a complex interrelationship between FDI and exports. Part V concludes and discusses the limitations of our research.

## **II. Theories on FDI from developing countries**

Beginning with the seminal work of Lecraw (1977) and Wells (1983), there is a large and growing theoretical literature on the locational determinants of FDI. The early contributions focused on explaining what makes FDI from developing countries different from that of firms from developed countries. From this literature three potential explanations for FDI emerge. First, originating from the work of Markusen (1984, 1995, and 2002) there is the assumption that firms have multi-plant economies, and that they are mainly engaged in horizontal FDI. In this framework firms have a certain competitive ownership advantage that can be extended to foreign markets by engaging in FDI. For firms from developed countries, often such competitive advantages are based on the ownership of intellectual property such as patents, brand names, and management systems. The broad implication for FDI strategies is that firms choose to locate in foreign markets where they can sell their differentiated products. These are typically countries with large internal markets and high-income consumers, i.e. FDI goes to other high income countries.

In the early literature it was also argued that ownership advantages of multinational enterprises from developing countries result in the opposite pattern. Because the competitive advantage of developing countries firms lies in their superior management of

low-cost production processes MNEs from developing countries invest in other low wage countries (Tolentino 1993). Similarly Ferrantino (1992), Benito and Gripsrud (1995), and Dunning (1997) argue that developing countries invest in other developing countries to exploit proximity in ethnicity, culture and geography. Yin and Choi (2005) show that these elements are important for Asian multinationals investing in China. In other words, developing countries mainly invest in their neighbours.

A second explanation in the form of vertical FDI can be found in the work of Helpman (1984 and 1987). He argues that firms break up their value chain by shifting parts of their production processes overseas. In more recent papers it is noted that firms from developed countries locate skill-intensive headquarter services in Northern countries, and production facilities in Southern countries that are assumed to have manufacturing lower costs. These lower transaction costs result in FDI and outsourcing of labor-intensive stages of the production process towards lower wage countries. From this the inference drawn is that developing countries' FDI strategies may well differ from those of richer countries because firms from developing countries typically have a comparative advantage in labor-intensive production. That being the case vertical specialization may induce them to shift skill-intensive activities (such as design, R&D and marketing) to developed countries where there are more high-skill employees. Also, because firms in developing countries specialize in mass production at the end of the product cycle this type of production involves natural resource intensive processes. This pattern leads to vertical integration by buying the companies that source their production. Therefore, FDI is then aimed at securing resources such as energy, commodities and minerals.

The third view is based on the early work by Hymer (1960) and that of the Uppsala School. Here the idea is that FDI incrementally follows exports: investments are often transaction-enforcing in that they support existing exports.<sup>3</sup> Based on survey data, this type of FDI seems to be important for Chinese companies. In a questionnaire by MOFTEC (The Ministry of Foreign Trade and Economic Cooperation), when asked why they to engage in FDI, 47% of Chinese executives indicated that the primary reason was to expand overseas

<sup>3</sup> See also Yeung (1998) for an application to Singapore and Malaysia.

markets (Li 2000). In their survey, UNCTAD (2003: 5) also notes that buying local distribution channels to facilitate exports is a major reason for Chinese firms' FDI to mature markets. Similarly, earlier studies by Zhang and Den Bulcke (1996) found that the top motive for foreign investment by Chinese firms is to advance exports.<sup>4</sup> Based on their survey in 1993, Table 1 shows motives of 16 large- and medium-sizes Chinese firms and 31 of their overseas manufacturing subsidiaries to invest abroad.

Table 1: Motives of Chinese firms' foreign investment (Top 10)

Motives	Most recent subsidiary	Oldest subsidiary	Largest subsidiary	Total sample ranking
Expansion into new market	3.4	3.8	3.3	3.6
To advance exports of parent company	3.4	3.6	3.2	3.5
To be near export markets	3.3	3.6	3.2	3.4
Access to information abroad	2.9	3.8	2.8	3.3
Following home country's strategy	4.0	2.3	3.2	3.2
To build up international experience	3.1	3.3	2.8	3.1
Access to third country markets	2.8	3.5	2.8	3.1
Diversification of production	2.3	3.2	3.0	2.9
Higher rate of profit abroad	2.9	2.2	3.3	2.6
To use product innovation	3.2	2.2	2.7	2.6

Data source: Zhang and Bulcke. International Management Strategies of Chinese Multinational Firms, in John Child and Yuan Liu (1996) (eds), *Management Issues in China (II): International Enterprises*, London: Routledge 1996. Note: 29 firms responded, of which 8 were most recent subsidiaries, 8 the oldest and 5 the largest subsidiaries. The importance of each motive was ranked on a 1-5 point scale: 1 = very limited, 2 = limited, 3 = moderate, 4 = important and 5 = very important.

Summarizing the existing literature on the locational determinants of the host country to attract FDI from developing countries we have deduced three hypotheses:

**H1:** When **horizontal FDI** serves to extend a competitive advantage in low-cost production investment flows to countries that also have lower wages.

**H2:** Because developing countries need natural resources to support their industrialization,

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<sup>4</sup> Ekholm et al. (2003) argue that export may not be consumed in the host country only, for many countries serve as a platform for re-exportation. For example, this may explain the large exports of China to Peru.

**vertical FDI** flows to countries with natural resources and abundant human capital.

**H3:** When FDI is **transaction enforcing** investment flows increase with exports to the host country.

The following section discusses our research strategy for disentangling the complex motives that determine China's outward FDI.

### III. Data and Methodology

The sample panel covers China's 27 main outward FDI destinations over 8 years (1995-2002). We use a smaller sample of 27 countries than the top 30 host economies listed in Table 2 below. Specifically, Hong Kong and Macao are special cases because though they are economically independent they are part of China. Second, we exclude the U.S. because although the US is only one observation, in reality this bilateral interaction greatly affects much of the FDI from China. While including the U.S. does not change the statistical results, we felt that the analysis would be less affected by any distortions arising from this interaction. We will discuss this issue in the conclusion.

Table2: China's approved FDI outflows, top 30 destinations, 1979-2002  
(Millions of US dollars)

Rank	Economy	2002		1979-2002	
		Numbers of projects	Value	Cumulative numbers of projects	Cumulative investment value
	Total	350	982.7	6960	9340.0
1	Hong Kong, China	40	355.6	2025	4074.3
2	United States	41	151.5	703	834.5
3	Canada	4	1.2	144	436.0
4	Australia	15	48.6	215	431.0
5	Thailand	5	3.9	234	214.7
6	Russian Federation	27	35.5	482	206.6
7	Peru	..	..	20	201.2
8	Macao, China	2	2.0	229	183.7
9	Mexico	1	2.0	45	167.4

10	Zambia	1	0.3	18	134.4
11	Cambodia	3	5.1	61	125
12	Brazil	8	9.3	67	119.7
13	South Africa	3	1.7	98	119.3
14	Republic of Korea	7	83.4	62	107.8
15	Viet Nam	20	27.2	73	85
16	Japan	11	18.2	236	82.1
17	Singapore	6	2.1	172	71.7
18	Myanmar	5	15.8	38	66.1
19	Indonesia	6	3.7	59	65
20	Mali	..	..	5	58.1
21	Mongolia	7	3.4	69	56.6
22	Germany	6	2.8	150	51.5
23	New Zealand	2	0.9	26	48.7
24	Egypt	3	16.3	27	48.5
25	Oman	1	17.5	70	47.2
26	Papua New Guinea	..	..	20	44.7
27	Nigeria	9	11.4	49	44.3
28	Tanzania	2	0.4	19	41.3
29	Kazakhstan	3	26.9	51	39.6
30	Lao PDR	2	61	18	36.6

Source: Ministry of Commerce of China, *The Almanac of China's Foreign Trade and Economic Cooperation 2003*. Regions are ranked by China's cumulative investment value.

The transaction-enforcing hypothesis is tested by analyzing exports (*EXPORTS*) to the 27 countries. These data are available from the National Bureau of Statistics of China. The dependent variable is approved outward FDI (*FDI*) taken from MOFTEC (2003). Based on the theories of horizontal FDI, vertical FDI, and transaction-enforcing FDI, we focus on the following explanatory variables: market size of the host country, the host country labor costs, natural resource abundance, skill intensity, and the exports from China. As is standard in the literature, we use GDP<sup>5</sup> to capture the market size and GDP per capita as a proxy for wage rates (*GDPPC*) in the host economy. See for example: Helpman (1987) and Brainard (1997). The source of both of these series is the UNCTAD database. The *RESOURCES* variable is based on the exports share of fuel, ore and minerals in the total merchandise exports. Skill intensity is reflected by the human capital indicator (the World Bank Institute), the high-tech exports in total exports, the number of researchers per 1000

<sup>5</sup> The lagged one year GDP is applied to solve the multicollinearity problem, as in Culem (1988).

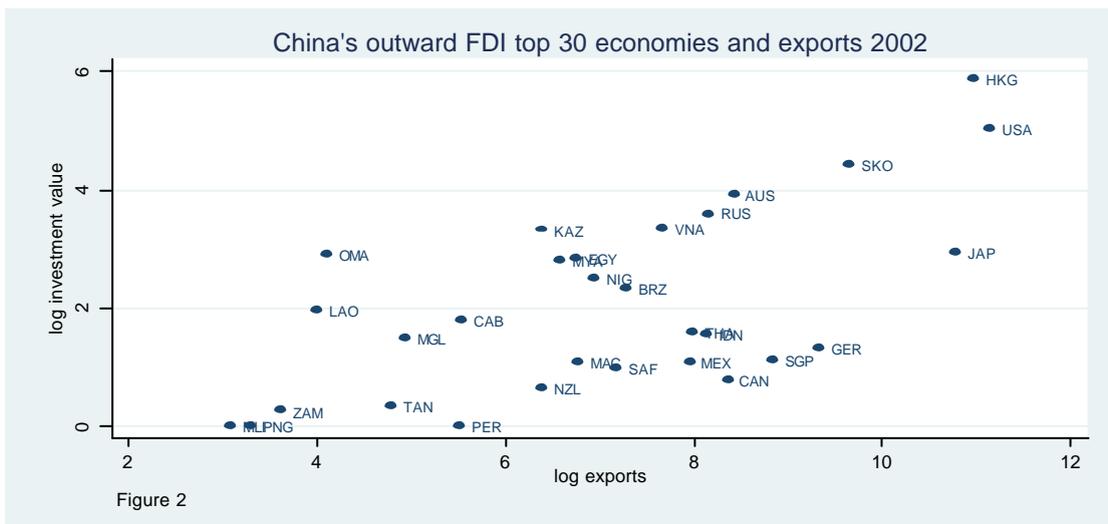
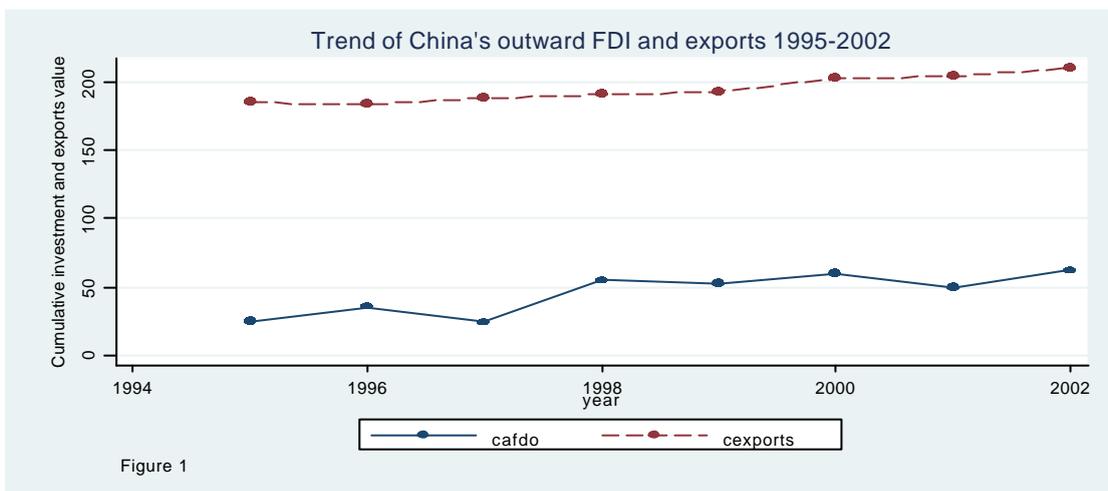
residents, and R&D applications (World Bank Development Indicators, 2005). Further, we control for governance, distance, ethnicity, and other factors such as GDP growth rate, that have been previously found to influence FDI. The outward FDI, exports, GDP, GDPPC are measured in US dollars in current prices and current exchange rates. A few surveys indicate the significant impact of national political infrastructure of the host country on FDI inflows. The governance indicator *NPI* is taken from the World Bank Institute (Kaufmann et al. 1999) and measured by six governance indicators, which are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. *DISTANCE* is the distance between the capital of the FDI destination and that of China and can represent the trade costs between nations. *ETHNIC* is measured by the share of Chinese speaking population in the FDI recipients and can reflect the ethnic relationship between FDI home and host nations. Year dummies are included to control for time trend. Summary and correlations for all variables are presented in Tables 3.1 and 3.2. Moreover, Figures 1 and 2 show some features of outward FDI and exports.

Table 3.1: Summary

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>lnAFDO</i>	216	1.3595	1.2596	0	4.8065
<i>lnGDP</i>	216	10.8622	2.2441	6.7945	15.4816
<i>lnEXPORTS</i>	216	6.1944	2.0526	2.1282	10.7879
<i>lnGDPPC</i>	216	7.5828	1.7076	4.8441	10.6498
<i>RESOURCES</i>	211	27.3956	28.6761	0	100
<i>lnNPI</i>	216	-0.7039	0.3539	-1.6820	-0.1210
<i>lnHDI</i>	216	-0.3992	0.2783	-1.1809	-0.0222
<i>RESEARCH</i>	216	1.1304	1.5305	0	5.37
<i>TECHEXPE</i>	216	3.5243	3.6742	0	14.5
<i>HITEEXP</i>	216	10.5863	12.8861	0.05	61.5
<i>GDPGR</i>	216	3.6164	3.7429	-13.13	13.75
<i>ETHNIC</i>	216	0.1111	0.3149	0	1
<i>DISTANCE</i>	216	7243.29	4499.632	955.6511	16948.04

Table 3.2: Correlations

	<i>lnAFDO</i>	<i>lnGDP<sub>t-1</sub></i>	<i>lnEXP</i>	<i>lnGDPPC</i>	<i>RES~</i>	<i>lnNPI</i>	<i>lnHDI</i>	<i>RESE~</i>	<i>TECH</i>	<i>HITEEXP</i>
<i>lnAFDO</i>	1.0000									
<i>lnGDP<sub>t-1</sub></i>	-0.0014	1.0000								
<i>lnEXPORTS</i>	0.0646	0.8631	1.0000							
<i>lnGDPPC</i>	-0.1495	0.7970	0.6562	1.0000						
<i>RESOURCES</i>	-0.0061	-0.2096	-0.3256	-0.1657	1.0000					
<i>lnNPI</i>	-0.1802	0.5190	0.4098	0.8584	-0.2470	1.0000				
<i>lnHDI</i>	-0.0396	0.7646	0.7388	0.8704	-0.1675	0.6614	1.0000			
<i>RESEARCH</i>	-0.1690	0.6251	0.6613	0.7642	-0.1797	0.6429	0.6657	1.0000		
<i>TECHEXPE</i>	-0.0383	0.6366	0.6146	0.7363	-0.3226	0.6961	0.6832	0.6751	1.0000	
<i>HITEEXP</i>	-0.0928	0.4416	0.4879	0.5469	-0.2707	0.4739	0.4362	0.4852	0.5236	1.0000



In Part 3 we present the results of static random effects estimation.<sup>6</sup> We use a random effects model because we have a limited number of cross-sectional observations as well as a limited number of years.<sup>7</sup> To compensate for this we investigate several models which allow us to identify variables that are consistently significant across regressions.

Unfortunately our base-line random effects regression does not allow us to make a clear distinction between the hypotheses. First, *EXPORTS* may well be endogenous to market size (*GDP*), so that it is unclear what the *EXPORTS* variable captures (are exports to some extent a reflection of *GDP*?) By including an interaction term between the two, we are able to shed more light on which of these two variables is more important. The same problem holds for *EXPORTS* and *GDP* per capita (*GDPPC*). It may well be that FDI towards low wage countries is caused by the fact that low wage countries prefer the low-price product from China (so the transaction-enforcing motive is important). However, it may also be that firms from China set up new production facilities (horizontal FDI) in low wage countries. Again, adding an interaction term clarifies the results, and this regression helps to separate the arguments.

From the static panel a picture emerges that the transaction-enforcing motive for FDI dominates for China. However, from previous analyses based on long-term series for a single country (e.g. see: Bajo-Rubio and Montero-Munoz 2001 and the references therein), we know that various dynamic and interdependent relations between FDI and exports may make it difficult to establish the causal effects. These are complicated issues to address with certainty, but there are accepted techniques to deal with this issue. We use Arellano-Bond GMM dynamic panel-data estimation to get at the causality relationship between FDI and the exports. Assuming that (a) the error term is not serially correlated and (b) the explanatory variables are weakly exogenous, we are able to use internal instruments

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<sup>6</sup> We first tested the panel unit roots and panel cointegration. All the series concerned are  $I(1)$  but cointegrated. We do not report the test results for two reasons. First, the sample covers only 8 years, which is too short to obtain the valid panel unit roots, and cointegration tests results (assuming  $T$  is finite). Second, first-differencing in the dynamic analysis helps to insure the stability of the cointegration framework.

<sup>7</sup> All pass the Hausman test. We have conducted the fixed effects estimations, of which the results are qualitatively the same at a lower level of significance.

based on a dynamic first-differenced model. Taking first-differences is necessary to eliminate the country-specific effects, and let us work with the cointegrated series. The internal instruments are used to deal with the possible endogeneity of the explanatory variable (*EXPORTS*) and the lagged dependent variable.<sup>8</sup> Clearly, the disadvantage of using first-differences is that we may lose significant variables that are close to constant over time. We will see that this has important implications for the explanatory power of the wage variable because *GDPPC* is relatively stable when compared to the other variables. Moreover, by applying a panel error correction model,<sup>9</sup> we find the dynamic effects of a change in exports upon current (short-run) and future (long-run) FDI. We also employ Arellano-Bond GMM dynamic panel-data estimation to solve the endogeneity problem in this case.

#### IV. Panel estimation results

Table 4 reports the results from the random effects model. The following results stand out. In Column (1) we see that FDI is positively correlated with *EXPORTS* and negatively with wages (*GDPPC*). Hence, the estimation results present first evidence that FDI has a transaction-enforcing motive and an ownership motive. Since we observe that market size is insignificant, this contradicts the horizontal FDI hypothesis. To check robustness, we ran various regressions controlling for skill intensity in the host country. We fail to find evidence in favour of vertical FDI towards skill-intensive host countries. In addition, observe that three controls perform poorly. First, for the period 1995-2002 the variable *RESOURCES* seems to be uncorrelated with China's FDI. Second, the share of Chinese speaking population (*ETHNIC*) is insignificant. Third, China's FDI seems not to be influenced by governance indicators (*NPI*). Also, note that the *DISTANCE* variable is positive, indicating that neighbouring counties are not the important hosts for China's FDI.

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<sup>8</sup> The new error term  $e_{it} - e_{it-1}$  is correlated with the lagged dependent variable  $y_{it-1} - y_{it-2}$ . The GMM estimates are derived based on the conditions:  $y_{it-s}$  and  $X_{it-s}$  are not correlated with  $e_{it} - e_{it-1}$ ,  $s = 2$ .

<sup>9</sup> The error correction model is specified as  $y_{it} = \mathbf{a} + \mathbf{g}\Delta X_{it} + \mathbf{I}X_{it-1} + \mathbf{r}y_{it-1} + \mathbf{b}CV_{it} + v_i + \mathbf{e}_{it}$ . The short-run effect of exports is  $\beta$ , and the long-run impact can be measured by  $\beta/(1-\alpha)$ .

Columns (2) and (3) present the interaction results for the three main variables. In Column (2), note that the interaction term between exports and GDP is insignificant and the coefficient is very small. This leads us to exclude the possibility that exports and GDP both contribute to FDI. In other words, exports matter more than market size. In Column (3), including the interaction term for GDP per capita and exports shows that both terms with GDP per capita are insignificant, though jointly significant. We conclude that low wages do not matter in the absence of exports. This result serves as evidence that the transaction-enforcing motive dominates the ownership advantage motive in low wage production. Additional robustness checks are presented in Column (4) and (5). First, we control for openness of the host country, to see whether the export-hub hypothesis is supported. The term is insignificant. Second, we control for total FDI received by the host country. This result is also insignificant. Finally, falling to account for substitution over time (Bloningen 2001) we add a quadratic exports term. We do not find a negative effect on exports in this sample.

Table 4: Static panel results  
Dependent variable is the log of China's outward FDI

Independent Var.	(1)	(2)	(3)	(4)	(5)
<i>lnGDP<sub>t-1</sub></i>	-0.102 [0.58]	0.203 [0.73]	-0.122 [0.69]	-0.135 [0.55]	-0.052 [0.29]
<i>lnGDPPC</i>	-0.238** [2.11]	-0.218* [1.93]	0.063 [0.23]	-0.21 [1.44]	-0.214* [1.89]
<i>lnEXPORTS</i>	0.307* [1.74]	0.669** [2.17]	0.645* [1.93]	0.357* [1.74]	0.576* [1.84]
<i>lnEXPORTS<sup>2</sup></i>					-0.028 [1.05]
<i>RESOURCES</i>	0.002 [0.39]	0.000 [0.02]	0.000 [0.06]	0.002 [0.34]	0.001 [0.25]
<i>ETHNIC</i>	-0.302 [0.72]	-0.429 [1.01]	-0.423 [0.98]	-0.277 [0.48]	-0.318 [0.77]
<i>DISTANCE</i>	0.461 [1.58]	0.299 [0.96]	0.458 [1.57]	0.552* [1.72]	0.343 [1.11]
<i>OPENNESS</i>				-0.099 [0.23]	
<i>OTHERFDI</i>				-0.017 [0.17]	
<i>lnGDP<sub>t-1</sub>*lnEXPORTS</i>		-0.04			

	[1.43]		
<i>lnGDP</i> PC* <i>lnEXPORTS</i>		-0.043	
		[1.19]	
F-test (p-value)	<i>Exports:</i> <i>p = 0.08</i>	<i>Exports:</i> <i>p = 0.10</i>	<i>Exports:</i> <i>p = 0.12</i>
	<i>GDP:</i> <i>p = 0.30</i>	<i>GDP</i> PC: <i>p = 0.05</i>	

Note: Robust z statistics in brackets: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. No. of Observations = 189. All results are from the random effects estimation and pass Hausman test. Other variables used but not reported because of insignificance: *GDPGR*, Skill intensity (measured by various indicators: human capital indicator, high-tech exports, the number of researchers per 1000 residents, and R&D applications), governance indicator (*NPI*), and *ASIA* dummy; year dummies included. Standard errors are corrected for the first-order autocorrelation.

In Part 2 we mentioned that it is difficult to find a clear causal relation between exports and FDI because of the complex interdependence of these variables. Table 5 presents the Arellano-Bond GMM estimates. The serial correlation tests support the null that there is no second-order autocorrelation. The Sargan test shows the exogeneity of the instrument variables. We observe that only the coefficient of exports from China is significant, except for the lagged dependent variable. Further note that in Column (4) the *EXPORTS* variable is negative and the squared *EXPORTS* variable is positive. This leads us to surmise that FDI follow exports after a certain base level is achieved. This result strongly negates the hypothesis that exports crowd out FDI over time, and again supports the transaction-enforcing motive. For robustness, we report the results of using the large sample including Hong Kong, Macao, and the US in Column (5). The impact of exports is more significant in this large sample.

Furthermore, Table 6 shows the inner-relation between Exports and FDI. This provides additional strong evidence that the relation runs from exports to FDI and not the other way around. This finding shows that FDI follows exports, but is not important to promote further exports. Here we suppose that factors used to explain FDI are similar to those for the exports.

Table 5: Arellano-Bond Dynamic GMM estimates

Dependent variable is differenced log outward FDI

	(1)	(2)	(3)	(4)	(5)
$\Delta \ln AFDO_{t-1}$	0.223** [2.08]	0.129 [1.35]	0.127 [1.34]	0.078 [0.85]	0.212* [1.79]
$\Delta \ln GDP_{t-1}$	-0.388 [0.37]	-0.686 [0.61]	-0.369 [0.41]	0.149 [0.16]	-0.445 [0.54]
$\Delta \ln GDP_{PC}$	0.527 [0.53]	0.627 [0.66]	0.452 [0.32]	0.414 [0.44]	0.064 [0.06]
$\Delta \ln EXPORTS$	0.841*** [2.45]	0.542 [0.39]	0.975 [0.74]	-0.949 [1.21]	0.965*** [2.76]
$\Delta (\ln EXPORTS)^2$				0.147** [2.35]	
$\Delta RESOURCES$	0.011 [0.41]	0.000 [0.01]	0.014 [0.53]	-0.002 [0.09]	0.016 [0.58]
$\Delta (\ln GDP_{t-1} * \ln EXPORTS)$		0.030 [0.24]			
$\Delta (\ln GDP_{PC} * \ln EXPORTS)$			-0.015 [0.09]		
F-test (p-value)		<i>Exports:</i> $p = 0.02$	<i>Exports:</i> $p = 0.02$	<i>Exports:</i> $p = 0.00$	
		<i>GDP:</i> $p = 0.82$	<i>GDP:</i> $p = 0.92$		
Sargan test (p-value)	0.997	0.999	0.999	0.100	0.100
Second-order AR (p-value)	0.757	0.661	0.519	0.707	0.535

Note: Robust z statistics in brackets: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. No. of Observations = 162. Other variables used but not reported because of insignificance: Skill intensity, *NPI*, and *GDPGR*. Year dummies are included.

Table 6: Inner-relation between FDI and Exports

Independent	Dependent $\Delta \ln AFDO$	Dependent $\Delta \ln EXPORTS$
$\Delta \ln EXPORTS$	-0.949 [1.21]	
$\Delta (\ln EXPORTS)^2$	0.147** [2.35]	
$\Delta \ln AFDO$		0.046 [0.64]
$\Delta (\ln AFDO)^2$		-0.001 [0.07]
F-test (p-value)	$p = 0.00$	$p = 0.13$

Note: Robust z statistics in brackets: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Finally, Table 7 offers the dynamic GMM estimation results of the panel error correction model. For these results it is clear that an increase in exports leads to an increase in FDI and an even larger FDI growth over time.

Table 7: Arellano-Bond Dynamic GMM estimates of the panel error correction model

Dependent variable is differenced outward log FDI				
	(1)	(2)	(3)	(4)
$\Delta \ln AFDO_{t-1} (r)$	0.390*** [3.67]	0.093 [0.95]	0.138 [1.42]	0.111 [1.19]
$\Delta \ln GDP_{t-1}$	0.366 [0.21]	-0.006 [0.00]	-0.585 [0.63]	0.098 [0.10]
$\Delta \ln GDPPC$	1.528 [0.74]	0.549 [0.58]	0.410 [0.26]	0.238 [0.25]
$\Delta \Delta \ln EXPORTS (g)$	1.748*** [3.85]	0.986*** [2.59]	0.996*** [2.55]	0.740* [1.89]
$\Delta \ln EXPORTS_{t-1} (I)$	1.589*** [2.87]	1.400 [0.94]	0.655 [0.42]	-1.189 [1.41]
$\Delta (\Delta \ln EXPORTS^2)$				-0.374 [0.60]
$\Delta (\ln EXPORTS_{t-1})^2$				0.160** [2.33]
$\Delta RESOURCES$	0.002 [0.07]	0.011 [0.41]	0.013 [0.46]	0.017 [0.64]
$\Delta (\ln GDP_{t-1} * \ln EXPORTS_{t-1})$		-0.060 [0.44]		
$\Delta (\ln GDP PC * \ln EXPORTS_{t-1})$			0.023 [0.11]	
F-test (p-value)		(long-run) Exports: $p = 0.10$ GDP: $p = 0.84$	(long-run) Exports: $p = 0.07$ GDPPC: $p = 0.85$	(short-run) Exports: $p = 0.17$ (long-run) Exports: $p = 0.02$
Sargan test (p-value)	1.000	1.000	1.000	0.100
Second-order AR (p-value)	0.842	0.600	0.612	0.196

Note: Robust z statistics in brackets: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. No. of Observations = 162. Other variables used but not reported: Skill intensity, *NPI*, and *GDPGR*. Year dummies are included.

## V. Conclusion

This paper has provided evidence that China's outward FDI is mainly driven by the desire to secure export markets. The transaction-enforcing motive is evidenced as the dominant factor in various specifications. In addition, we have disentangled causal effects by using dynamic GMM methodology and uncovered some interesting interactions between exports and FDI. In the presence of exports China's FDI flows to low-wage countries. These results support views that China is a major supplier to low income countries, and that Chinese firms try to expand this competitive advantage by engaging in FDI.

Four observations are offered regarding the limitations of this study and suggestions for further research. First, by excluding FDI to the US and Hong Kong and Macao we failed to account for nearly 30% of China's FDI. It can be argued that in the case of Hong Kong that outward FDI is of a different nature than other Chinese investments. Specifically these investments focus much more on services and transport. For future research, using an updated series it may be of interest to include FDI from Hong Kong to obtain a more complete understanding of Chinese investment after the return of Hong Kong. Our rationale for excluding the U.S. is more arbitrary, though including the US does not change the results. Ideally the U.S. should be included but it would make more sense to disaggregate states or regions in the U.S. Unfortunately these data are currently unavailable. We acknowledge a weakness of our analysis in that we cannot exclude the possibility that some portion of China's overall FDI is market seeking, and geared towards high-skill countries because much of it ends up in the US.

A second qualification of the results is that our data set that ends in 2002. We may find that after 2002 other determinants of FDI have become more important as China's growth has more and more come to rely on the stable supply of natural resources (UNCTAD 2006). Also, with the increase in economic power, geopolitical interests have become more important to China. For example, the popular press suggests that FDI from China “buys” political support in developing countries (*The Economist*, October 26, 2006).

Again, these are interesting topics for future research.

Third, we focus on approved FDI mainly from state owned companies. In this respect we acknowledge that China is somewhat unique because the country is run by a centralized bureaucracy. Critics therefore might argue that although approved FDI indeed captures a substantial portion of total FDI this investment may be distorted by the political process and not driven by market forces alone. Although we agree that China's unique characteristics are important, we wish to stress that in most developing countries the role of the state is large and restrictions on cross-border capital movements severe.

Finally, we have focussed on the locational determinants of FDI, thereby disregarding a large literature that deals with the internal dynamics of FDI (for surveys see: Dunning 1988 and Riemens 1989). In this respect FDI is explained by arguing that outward investment follows a specific path that can be linked to stages of a country's economic development. As was mentioned earlier Liu et al. (2005) investigated the internal determinants of FDI for China and concludes that the country is following a standard pattern that is highly influenced by rising GDP. As we move forward with our research on this topic we will consider the possibility of merging this strand of the literature with an updated analysis of country pull factors.

## References

- Anand, J. and K. Bruce, Technological Capabilities of Countries, Firm Rivalry and Foreign Direct Investment, *Journal of International Business Studies*, 28, 3, 1997, pp. 445-467.
- Barba Navaretti, G. and A.J. Venables, *Multinational Firms in the World Economy*, United Kingdom: Princeton University Press 2004.
- Benito, G.R.G. and G. Gripsrup, The Internationalisation Process Approach to the Location of Foreign Direct Investment: An Empirical Analysis, in Green, M. B. and R. B. McNaughton (eds.), *The Location of Foreign Direct Investment*, Hampshire: Avebury 1995.
- Bajo-Rubio, Oscar and María Montero-Muño, Foreign Direct Investment and Trade: a Causality Analysis, *Open Economies Review*, 12, 2001, pp. 305-323.
- Blonigen, Bruce A., In Search of Substitution between Foreign Production and Exports, *Journal of International Economics*, 53, 2001, pp. 81-104.
- Brainard, S.L., An Empirical Assessment of the Proximity-Concentration Trade-off between Multinational Sales and Trade, *American Economic Review*, 87, 4, 1997, pp. 520-544.
- Buckley, P. J., L. J. Clegg, A. R. Cross, X. Liu, H. Voss, and P. Zheng, The Determinants of Chinese Outward Foreign Direct Investment, *Journal of International Business Studies*, 38, 2007, pp. 499-518.
- Cheng, L.K. and K.K. Yum, What Are the Determinants of the Location of Foreign Direct Investment? The Chinese Experience, *Journal of International Economics*, 51, 2000, pp. 379-400.
- Culem, C., The Locational Determinants of Direct Investments among Industrialised Countries, *European Economic Review*, 32, 1988, pp. 885-904.
- Dunning, J.H., Explaining the International Direct Investment Position of Countries: Toward a Dynamic and Development Approach, *Weltwirtschaftliches Archiv*, 117, 5, 1981, pp. 30-64.
- Dunning, J.H., R. van Hoesel and R. Narula, Third World Multinationals Revisited: New Development and Theoretical Implications, in Dunning, J. H. (eds.), *Globalisation, Trade and Investment*, Elsevier, Amsterdam, 1998, pp. 255-286.
- Ekholm, K., R. Forslid, and J. Markusen, Export-Platform Foreign Direct Investment, NBER Working Paper 9517, 2003.

- Ferrantino, M.J., Transaction Costs and the Expansion of Third-World Multinationals, *Economics Letters*, 38, 4, 1992, pp. 451-456.
- Gao, Ting, Ethnic Chinese Networks and International Investment: Evidence from Inward FDI in China, *Journal of Asian Economics*, 14, 2003, pp. 611-629.
- Guo, Ju'e, Natural Resources and Economic Development in China, *Chinese Economics Studies*, 29, 1996, pp. 5-21.
- Helpman, E., A Simple Theory of Trade with Multinational Corporations, *Journal of Political Economy*, 92, 1984, pp. 451-471.
- Helpman, E., Imperfect Competition and International Trade: Evidence from Fourteen Industrial Countries, *Journal of the Japanese and International Economies*, 1, 1987, pp. 62-81.
- Hines, J., Altered States: Taxes and the location of Foreign Direct Investment in America, *American Economic Review*, 86, 1996, pp. 1076-1094.
- Hymer, S.H., *The International Operations of National Firms*, Cambridge, MA: MIT Press, 1960.
- Lecraw, D.J., Direct Investment by Firms from Less Developed countries, *Oxford Economic Papers*, 29, 3, 1977, pp. 442-457.
- Li, Gang, *Go Abroad: Opening-Up Strategy and Case Study* (in Chinese), Beijing: China Foreign Economics and Trade Press 2000.
- Liu X., T. Buck and C. Shu, Chinese economic development, the next stage: outward FDI?, *International Business Review*, 14, 2005, pp. 97-115.
- Lunn, J., Determinants of US Direct Investment in the EEC: Further Evidence, *European Economic Review*, 13, 1, 1980, pp. 93-101.
- Markusen, James R., Multinationals, Multi-Plant Economies, and the Gains from Trade, *Journal of International Economics*, 16, 1984, pp. 205-226.
- Markusen, James R., The Boundaries of Multinational Enterprises and the Theory of International Trade, *Journal of Economic Perspectives*, 9, 1995, pp. 169-190.
- Markusen, J. R. and K. E. Maskus, Discriminating Among Alternative Theories of the Multinational Enterprise, *Review of International Economics*, 10, 4, 2002, pp. 695-707.
- Ministry of Commerce of China, *Almanac of China's Foreign Economic Relations and*

*Trade*, Beijing: China Prospects Publishing House 1995/96; 1996/97; 1997/98; 1998/99; 1999/2000; 2000/2001; 2001/2002.

Riemens, P.J.H., *On the Foreign Operations of Third World Firms*, Amsterdam: University van Amsterdam 1989.

Tolentino, P.E., *Technological Innovation and Third World Multinationals*, London: Routledge 1993.

UNCTAD, *Research Note: China, an Emerging FDI Outward Investor*, 2003.

UNCTAD, *World Investment Report 2003*, New York and Geneva: United Nations 2004a.

UNCTAD, *World Investment Report 2005*, New York and Geneva: United Nations 2006a.

Wells, L., *Third World Multinationals: The Rise of Foreign Investment from Developing Countries*, Cambridge, MA: MIT Press 1983.

Yang, Dexin, *China's Offshore Investments: A Network Approach*, Northampton: Edward Elgar Publishing Limited 2005.

Yeung, H.W.C., Translational Economic Synergy and Business Networks: The Case of Two-way Investment between Malaysia and Singapore, *Regional Studies*, 32, 8, 1998, pp. 687-706.

Yin, E. and C. J. Choi, The Globalization Myth: the Case of China, *Management International Review*, 45 (Special Issue), 2005, pp. 103-120.

Zhang, Haiyan and D. den Bulcke, China: Rapid Changes in the Development Path, in Dunning, J.H. and R. Narula (eds.), *Foreign direct Investment and Government: Catalysts for Economic Restructuring*, London: Routledge 1996.

Zhang, Haiyan and D den Bulcke. International Management Strategies of Chinese Multinational Firms, in John Child and Yuan Liu (1996) (eds), *Management Issues in China (II): International Enterprises*, London: Routledge 1996.