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The Empirics of China's Outward Direct Investment*

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Abstract

We investigate the empirical determinants of China's outward direct investment (ODI). It is found that China's investments in developed and developing countries are driven by different sets of factors. Subject to the differences between developed and developing countries, there is evidence that a) both market seeking and resources seeking motives drive China's ODI, b) the Chinese exports to developing countries induce China's ODI, c) China's international reserves promote its ODI, and d) the Chinese capital tends to agglomerate among developed economies but diversify among developing economies. Similar results are obtained using alternative ODI data. We do not find substantial evidence that China invests in African and oil-producing countries mainly for their natural resources.

Keywords: Market Seeking, Resources Seeking, Servicing Exports, International Reserves, Agglomeration Effect
JEL Classification: F21, F36, O53

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1. Introduction

Whether it is entirely true or apocryphal, the emergence of China in the global economic stage has engendered a strong feeling of *déjà vu*. During pre-modern times, China was estimated to have a *per capita* GDP higher than that of Europe before 1280, and accounted for 23.2% to 32.4% of world output from 1700 to 1820 (Maddison, 1998). Indeed, China was one of the major trading centers in the world. During the 16th and 17th centuries, China ran a substantial trade balance surplus and was referred to as the "sink" for silver, the vehicle currency of international trade in the *de facto* silver standard era (Sakakibara and Yamakawa, 2003a, b). There is little doubt that the re-emergence of China is changing the landscape of the global economy; the question is, in what direction?

There is a plethora of analyses of China's economic prowess in terms of its ballooning trade surplus and international reserves, and its ability to draw in foreign direct investment (FDI).[1] The role of China as an outward investor has been seldom discussed and only catches attention following some publicized large-scale (attempted) buyouts of the US companies including IBM's personal computer division and the oil company Unocal.

Compared with inflows, China's outward direct investment (ODI) is quite small. According to the United Nations statistics, China's FDI inflow and ODI ratio was 6.4 to 1 in 2005. However, since the beginning of the new millennium, China's direct investment abroad has surged apace. During the 1994-1999 period, China's outward investment stood at the level of US$ 2.2 billion (annual average) and accounted for 3.4% of outflows from developing countries. In 2005, China's outward investment jumped fivefold to 11.3 billion and accounted for 9.6% of outflows from developing countries. With its burgeoning trade surplus and international reserves, China is expected to enhance its role as a significant provider in the international capital market. Indeed, China ranks fourth in the list of expected leading sources of FDI (UNCTAD, 2005).

One interesting feature of China's outward investment is its concentration in developing countries. The 2007 United Nations report, for example, points out that China is one of the major capital providers for developing countries in Africa (UNCTAD, 2007). China's outward investment, thus, has substantial implications for the economic development of the world economy in general and for developing countries in particular. Further, together with capital inflows, capital outflows offer a balanced way to integrate China into the global economy.

Against this backdrop, we examine Chinese investment in overseas markets. To be sure, we are hardly walking in fresh snow and there are a few studies on China's ODI. The extant studies are mostly

[1] Other closely scrutinized issues including the Chinese currency valuation and trade imbalances; see for sample, Cheung *et al.* (2007) and Cheung *et al.* (2009).

descriptive in nature and policy-oriented.[2] The theme of the current exercise is to empirically analyze the evolution of China's ODI and its determinants.

To anticipate the results, China's outward investment displayed a steady increase in the 1990s and a surge in the new millennium. There is also a discernable change in the composition of the host countries and the industry mix of China's overseas investment. The estimation results lend support to the conjecture that China has different motivations in deploying its capital to developed and developing countries.

In addition to the usual economic explanatory variables, we examine the motive of servicing exports, the role of international reserves, and the agglomeration effect. These factors are found to have varying degrees of explanatory power across developed and developing countries. In examining the data from African and oil-producing countries, we find only limited evidence that exports of natural resources from these countries attract some additional amount of China's ODI.

In the next section, we briefly describe China's outward investment policy and present some preliminary descriptions of China's ODI data. Section 3 contains the main empirical results. Some additional analyses are provided in Section 4. Section 5 offers some concluding remarks.

2. Preliminary Discussions

2.1 A Brief History

Arguably, the open door policy initiated in 1978 was – and remains – a key defining event in the contemporary Chinese economic history.[3] The change in FDI policy accompanying economic reform programs has greatly altered the economic scene. Indeed, there are two prongs of China's foreign direction investment policy – one is to attract FDI inflow and the other is to place capital in overseas markets. Until recently, the success of attracting inflows has overshadowed the outward investment strategy.

Indeed, the ODI activity in the 1980s is quite minimal. Direct investment abroad in this period is perceived to be driven by political rather than economic considerations. Before 1985, only state-owned and local-government-owned enterprises were allowed to invest overseas. After 1985, private enterprises were permitted to apply for ODI projects. By1990, the stock of ODI stood at the level of US$1.2 billion. While

[2] Sung (1996) and Wall (1997) are two early studies on China's ODI. Some recent studies include UNCTAD (2003), Wong and Chan (2003) and Wu and Chen (2001). Asia Pacific Foundation of Canada (2005, 2006) offered some insights on China's ODI behavior from the perspectives of the Chinese enterprises.

[3] Officially, the policy change was adopted in the 1978 National Party Congress. See Rosen (1999) and OECD (2005) for accounts of the open door policy and its implications.

the activity is negligible, the period can be viewed as a period for authorities to design and develop procedures and policies for ODI.

Between 1991 and 1997, there was a flux of ODI to, especially, Hong Kong. The track record of these investment projects was not good. Due to the lack of investment know-how, ignorance about the rule of law in overseas markets, and corruption, there are instances of substantial losses from ODI projects. Thus, the period witnessed an upsurge of ODI activity followed by a tightening of approval procedures. At the end of 1997, the stock of ODI was at the level of US$2.4 billion. This period is the time China got a reality check on making commercial overseas investment.

The 1997 Asian financial crisis changed the global economic landscape. In adjusting its ODI strategy, China in 1999 issued a directive to encourage direct investment abroad that promotes China's exports via "processing trade" investment. The directive signifies an important shift of China's policy – from promoting overseas investment to directing ODI.

In 2002, the Chinese authorities pushed the "going global" or "stepping out" strategy to sustain the economic reform process and to promote global industry champions in the wake of the WTO accession.[4] On July 16, 2004, the authorities made another change in their ODI policy stance – they pronounced their roles of, in addition to approving applications, supervising and providing services. With these changes in the "going global" strategy, the Chinese enterprises are quite aggressive in the international capital market. Indeed, the Chinese outward investment is brought under the spotlight following some recent attempts to secure natural resources in developing countries and large-scale acquisition activities in the US.

In sum, since China opened up in 1978, the ODI policy has evolved together with other economic reform policies. Specifically, the ODI strategy has been transformed from a purely political device to a more market-oriented operation. In terms of the group of players, it has expanded from mainly state-owned enterprises to a mix of state-owned and commercial entities. Nevertheless, there is still a heavy state involvement in the ODI activity; at least, it is what is perceived by the rest of the world. While the absolute magnitude of China's ODI is quite small compared with other sources of FDI, China is expected to be among the top 5 leading FDI exporters in both the 2004 and 2005 UN surveys (UNCTAD; 2004, 2005).

2.2 China's ODI

Figure 1 plots China's ODI. The value of ODI was relatively stable in the 1980s, increased steadily in the 1990s, and displayed a sharp upward momentum in the new millennium. As a share of the world total FDI,

[4] For example, the 2002 issue of the *Almanac of China's Foreign Economic Relations and Trade* discusses the effort to implement vigorously the "going global" policy. Sometimes, the "going global" policy is translated as the "go global" policy.

China's ODI is quite small despite its twofold increase from 0.27% in 1991 to 0.54% in 2005. On the other hand, Chinese capital accounts for a steadily increasing proportion of the total FDI from developing countries, excluding offshore financial centers, during the sample period. In a word, the size of China's ODI is quite small but its trajectory is quite promising.

Figure 2 plots the shares of China's ODI stock in developed and developing countries. While flows to both developed and developing countries are increasing over time, the shares of the stock of ODI to developing countries show a clear trend. In 1999, the proportion of China's ODI in developing countries overtook that in developed countries. Since then, a larger and larger proportion is directed towards developing countries. The observation is in accordance with the usual belief that China is intensifying its economic involvements in developing countries.

China's ODI covers a wide geographic distribution. As of 2005, China invested in 163 countries and engaged in an extensive range of economic activities, including information technology, finance, retail, fish processing, and forestry. These overseas investments, however, are fairly concentrated in a few economies such as Australia, Hong Kong, Korea, Macau, Russia, and the US. Indeed, according to the official approval data from various issues of the *Almanac of China's Foreign Economic Relations and Trade*, the top 50 recipient countries on average received over 90% of China's ODI during the 1991-2005 period.

Snapshots of the geographic distributions in 1991, 1998, and 2005 are given in Figure 3. There is a discernable change in the geographic distribution of China's ODI over time. For instance, Asia is hosting an increasing share of China's ODI – its share has increased from 16% (1991) to 47% (2005). Latin America and Europe are the other two regions that experienced an increase of China's capital inflow with the former showing a more noticeable increase than the latter. These gains are registered at the expense of the flows to North America and Oceania. During these 15 years, Canada and the US in North America and Australia in Oceania account for a decreasing share of China's ODI stock. Specifically, these countries together hosted over 40% of the Chinese capital in 1991 but less than 10% in 2005. Africa is the only region that experiences an increase followed by a decrease in its share of China's ODI. In general, these numbers attest to the growing importance of Asia and Latin America and the declining role of North America and Oceania in hosting the Chinese capital.

In passing, we note that the evolution of the geographic distribution is qualitatively the same if Hong Kong and Macau, which are China's two special administration regions that have attracted a "disproportionately" large share of China's capital, were excluded from Figure 3.[5]

[5] The counterpart of Figure 3 that excludes Hong Kong and Macau data is given in Appendix A.

The sectoral distribution of China's ODI is graphed in Figure 4. Two observations stand out – the growth of the trade and trade services sector and the fading importance of the manufacturing sector. Starting from a level below 20% in 1993-95, the share of the trade and trade services sector increased to above 60% in 2005. On the other hand, the share of the manufacturing sector dropped from a high 60% to the low teens during the same period. The proportion of China's ODI that goes to the resources exploration section in the new millennium is higher than that in the 1993-95 period. Nonetheless, the increase may not match the recent hype about China's aggressiveness in securing natural resources around the world. In fact, the percentage of ODI in the resources exploration section is slightly above 15.1% in 2005 and is smaller than the level in 2001!

2.3 Some Data Issues

Relative to inflows to China, there are relatively few academic studies on China's ODI. It is conceived that data paucity imposes a severe constraint on analyzing China's ODI. China has only published its ODI data in a format that is consistent with the OECD and IMF standard since 2003. The data are published in *The Statistical Bulletin of China's Outward Foreign Direct Investment* by the Ministry of Commerce of the People's Republic of China. The Ministry of Commerce was formed in the spring of 2003 through re-organizing the former Ministry of Foreign Trade and Economic Co-operation. The relatively short sample period makes it difficult to assess the evolution of China's ODI.

In the current study, we consider an alternative data set that comprises data on China's outward FDI approved by the authorities. The approved ODI is the ODI originating from the Chinese enterprises that is approved by the Chinese government. Similar to most data on China, there are concerns about the accuracy of the approval data. For instance, the approved ODI data are different from the contracted or realized ODI data and they omit investment that does not go through the formal approval process. In general it is believed that these data understate China's overseas investment.[6]

There are several reasons to consider the approval data published by the Ministry of Commerce and the former Ministry of Foreign Trade and Economic Co-operation in the annual publication "*Almanac of China's Foreign Economic Relations and Trade*." The *Almanac* has reported aggregate ODI data since 1984. The country-specific approved ODI data are available since 1991. Thus, the approval data offer a reasonably long time series to investigate the linkages between the Chinese overseas investment and the characteristics of its host countries.

Even though the Chinese ODI strategy is evolving towards a market-oriented approach, it is still to a great extent dictated by government directives. The ODI projects approved by the authorities, thus, reflect

[6] The official approval data are subject to other issues including unauthorized capital flight, and "round tripping", which refers to capital that moves out of China and is then invested back in China via, say, Hong Kong. See, for example, Wong and Chan (2003). These problems also inflicted the Chinese official data on FDI from OECD (OECD, 2003).

China's policy stance and contain information on their determinants. Further, China has significant capital control. Despite that the control is perceived to be porous, moving a significant amount of capital out of the country is not an ordinary task. Thus, while the approval data are likely to understate China's overseas investment, they could offer some general information on reasons China is investing in overseas markets – especially given their relatively rich coverage of both host countries and time periods.

As a robustness check, we will present results based on some other sources of ODI data in Section 4.

3. Empirical Determinants

In this section we explore the determinants of China's ODI. Why does China send its capital abroad? What are the host-country characteristics that attract China's capital? Answers to these two questions depend on China's motives.

As discussed in Section 2.1, it is widely perceived that economic considerations are not the main motive behind China's overseas investment in the pre-1990 era. Further, host-country specific data are available only after 1991. Thus our sample period is from 1991 to 2005. The country-specific approved ODI data were collected from the *Almanac of China's Foreign Economic Relations and Trade*, various issues. Only data from the top 50 recipient countries as of 2005 are included in the sample.[7] We do not include all the recipient countries because China does not approve FDI to each one of them very year. Norway, for example, has not received any new approved ODI since 1991. The top 50 recipient countries, indeed, account for 90% of China's ODI. Thus, we believe that the selected country sample offers a good representation of the approval data.

3.1 A Benchmark Specification

Our basic specification of China's ODI behavior is

$$ODI_{i,t} = \alpha + \mu_i + \beta_1 GDP_{i,t-1} + \beta_2 RGDPpc_{i,t-1} + \beta_3 GDPG_{i,t-1} + \beta_4 Wage_{i,t-1} + \beta_5 Raw_{i,t-1} + \beta_6 Risk_{i,t-1} + \beta_7 Trend_t + \varepsilon_{i,t} \quad (1)$$

The dependent variable, $ODI_{i,t}$, is the host-country *i*'s stock of China's ODI at time *t* normalized by the host-country's population to facilitate comparison across countries of different sizes. The variable is expressed in logarithmic form.

[7] These economies are listed in Appendix B. Three offshore financial centers – Bermuda, the Cayman Islands, and the British Virgin Islands are excluded. Myanmar is dropped because its GDP data are not available.

Three aspects of the market-seeking motive are captured by the explanatory variables *GDP*, $RGDP_{pc}$, and *GDPG*. *GDP* is the ratio of the host-country's gross domestic product to the Chinese gross domestic product; both measured in US dollars. It represents the (relative) market size offered to ODI (Frankel and Wei, 1996; Kravis and Lipsey, 1982; Wheeler and Mody, 1992). The Chinese output is used to construct the ratio because China is the source country in the current exercise. $RGDP_{pc}$ is the host-country's real *per capita* income relative to China and is another commonly used indicator of market opportunities (Eaton and Tamura, 1994, 1996; Kinoshita and Campos, 2004; Lane, 2000; Lipsey, 1999). *GDPG* is the host-country's real income growth rate. It is a measure of market growth potential (Billington, 1999; Lee, 2000; Lipsey, 1999). We expect these three variables to have a positive coefficient under the market-seeking strategy. Data on these variables were drawn from the *World Development Indicators* database provided by the World Bank. A detailed description of the variables used in the study and their sources is given in Appendix C.

Two endowment related variables, *Wage* and *Raw*, are included to account for the resources seeking motive (Cheng and Kwan, 2000; Hatzius, 2000; Griffith-Joneses and Leape, 2002; de Melo *et al.*, 1997; Kinoshita and Campos, 2004). *Wage* is the host-country's average wage in the manufacturing sector relative to the Chinese one. It represents the cost advantage. *Raw* is given by the host-country's ratio of raw material exports (including fuels, ores, and metals) to its total merchandise exports and is a proxy for the abundance of natural resources. The data on *Wage* and *Raw* were retrieved, respectively, from the *United Nations International Labor Organization Database* and *World Development Indicators*.

Both poor institutional environment and risk deter foreign investment (Hines, 1995; Lipsey, 1999; Wei and Shleifer, 2000; Wheeler and Mody, 1992). The effects of these factors are captured by the variable *Risk*, which is a summary index of institutional and risk characteristics. It has 12 components including corruption, law and order, bureaucracy quality, and socioeconomic conditions, and is provided by the *International Country Risk Guide* (ICRG).[8]

To facilitate interpretation and avoid endogeneity issues, the lagged variables are used in the regression exercise. Besides these determinants, the host-country specific dummy variable μ_i is included to capture time invariant factors including the distance between China and the host country, the host-country's geographic characters, and culture resemblances between countries.[9] These time invariant factors are quite commonly included in the so-called "gravity" specification. The time trend dummy variable *TREND* captures trending behavior revealed in the figures.

[8] Both exchange rate and exchange rate volatility variables were found to be insignificant in preliminary analyses. Thus, these variables were not included, for brevity.

[9] Technically speaking, our panel regressions allowed for fixed effects. The Hausman test rejected the specification with random effects in favor of the one with fixed effects.

The results pertaining to estimating (1) are presented in Table 1. In anticipating that the factors determining the flow of Chinese capital to developed countries are different from those to developing countries, we fitted the model to the entire sample, the sample comprises developed countries, and the sample comprises developing countries. The effective numbers of observations used in the regression analyses are restricted by the availability of data on the explanatory variables. The reported results are based on a sample of 31 countries – 21 developing and 10 developed countries.[10] The estimates are obtained using the feasible generalized least squares procedure to control for serial correlated residuals.[11] For brevity, the estimates of the constant and the host-country specific dummy variables (μ_i s) are not reported.

The coefficient estimates are supportive of the conjecture that factors determining the Chinese capital going into developed and developing countries are not the same. Using estimates from the whole sample to assess China's overseas investment strategy can lead to misleading inferences. The most obvious example is the trend estimates – the one for developed countries is significantly negative while those for the whole sample and for developing countries are significantly positive. Thus, we separately examine the estimates from developing and developed countries.

For developing countries, all the three variables (*GDP*, $RGDP_{pc}$, and *GDPG*) capturing various aspects of the market-seeking motive are negative and statistically insignificant. Market seeking does not seem to be a main reason for China to invest in these developing countries.

The two endowment related variables *Wage* and *Raw* yield significant estimates that are consistent with the resources seeking motive – to go for low cost locations and to seek natural resources. According to the MOFTEC Offshore Plant Project (2000), 22.5% of the surveyed Chinese enterprises considered "cheap labor" in other developing countries as one of the most attractive factors for investing abroad. A few years later, however, another study reports that the surveyed Chinese enterprises assigned a relatively low score for the "access to low cost labour" as a driving factor for current Chinese ODI (Asia Pacific Foundation of Canada, 2005). Regarding the *Raw* result, it is interesting to note that, in two recent surveys, the Chinese enterprises played down the role of "access to natural resources" as a driving factor for current Chinese ODI and "to secure access to energy, raw materials and natural resources" as an important factor of ODI decision (Asia Pacific Foundation of Canada, 2005, 2006).

Apparently, China's ODI is quite insensitive to the host-country's risk characteristics – the *Risk* variable is not significant. The coefficient estimate of *Trend* is positive and is in accordance with the pattern revealed

[10] Among the 19 countries excluded from the 50-country sample, 16 have no data on *Wage*, 5 have no data on *Risk*, and 2 have no data on *Raw*.

[11] Specifically, serial correlation was corrected using country-specific serial correlation patterns. Unless stated otherwise, estimation results are corrected for serial correlation. Baltagi *et al.* (2007), for example, offers a recent assessment of serial correlation adjustment methods.

in Figure 2; China's ODI to these countries is increasing over time beyond the level predicted by the economic variables included in the regression.

The results for developed countries are quite different. First, the *GDP* variable is significantly positive – China's ODI tends to go to a large market as measured by its income level. The *per capita* income variable $RGDP_{pc}$, however, has a significantly negative estimate. It is noted that a large proportion of China's ODI is in the trade and trade services sector that facilitates China's exports to the host country and most Chinese exports are not of a high-end market nature. Apparently, the negative $RGDP_{pc}$ estimate attests to the market focus of China's ODI operations – most of them are geared towards low income rather than high income customers. The host-country's growth, *GDPG*, which is our third market-seeking variable, is not a significant factor.

Both the *Wage* and *Raw* variables are significantly positive for the developed countries. While the *Raw* estimate is consistent with the resources seeking motive, the *Wage* estimate is different from the cost advantage interpretation. Indeed, the different *Wage* estimates are suggestive of the possibility that China has different reasons to invest in developing and developed countries. While developing countries offer cost advantages, developed countries have advanced technologies and management methods, which are usually associated with higher wages. Indeed, according to a recent survey of the Chinese enterprises, "to acquire advanced technology" and "to learn advanced management methods" are amongst the most important factors of their ODI decisions (Asia Pacific Foundation of Canada, 2006). Thus, the positive *Wage* estimate for developed countries is in accordance with the motive to gain access to advanced technologies and management know-how via overseas investment.

Similar to the case of developing countries, China's investment in developed countries is not affected by their risk characteristics – the *Risk* variable is not significant. The negative trend estimate mirrors the developed countries' declining share of China's ODI.

In sum, the results in Table 1 identify some economic determinants of China's ODI and show that these determinants have different effects for developed and developing countries. According to the adjusted R-squares, the selected variables explain the data on ODI in developing countries better than those in developed countries.

In Section 2.1, it is noted that China's overseas investment policy has undergone some changes since 1991. There are two notable policy changes – one took place after the 1997 Asian financial crisis and the other one is the launch of the "going global" strategy in 2002. In view of these changes, we introduce two dummy variables, $D98_t \equiv I(t \geq 1998)$ and $D02_t \equiv I(t \geq 2002)$, where I(.) is an indicator function. The two dummy variables are interacted with the explanatory variables *Raw* and *Trend* to investigate the implications of policy changes for seeking natural resources in particular and for promoting overseas investment in general. Thus, we modify equation (1) to

$$ODI_{i,t} = \alpha + \mu_i + \beta_1 GDP_{i,t-1} + \beta_2 RGDPpc_{i,t-1} + \beta_3 GDPG_{i,t-1} + \beta_4 Wage_{i,t-1} + \beta_5 Raw_{i,t-1} + \beta_6 D98_t * Raw_{i,t-1} + \beta_7 D02_t * Raw_{i,t-1} + \beta_8 Risk_{i,t-1} + \beta_9 Trend_t + \beta_{10} D98_t * Trend_t + \beta_{11} D02_t * Trend_t + \varepsilon_{i,t} \quad (2)$$

The results of estimating (2) are presented in Table 2. In general, the inclusion of these interaction variables improves the goodness-of-fit. The specification for developed countries displays the best improvement – its adjusted R-squares estimate increases more than double from 21.68% to 51.56%.The interaction variables reveal some interesting information. For the whole sample, the *Raw* variable maintains its significance and the interaction term $D02 * Raw$ is significantly negative. One possible interpretation is that the "going global" policy is not biased in favour of ODI projects that secure natural resources and, thus, lowers the relative importance of the *Raw* related investment. The estimates for developing countries are similar to those for the whole sample. The data from developed countries tell a slightly different story – the $D02 * Raw$ factor is the only significant variable. Thus, there is evidence that China has increased its effort in securing natural resources in developed countries since 2002.

The coefficient estimates of *Trend* and its interaction variables appear consistent with the evolution of China's ODI described in Section 2.1. For developing countries, the *Trend*, $D89 * Trend$, and $D02 * Trend$ variables are all significantly positive – indicating that, in stepping up its effort to invest abroad, China has consistently increased its involvement in developing countries. Similar to the result in Table 1, the *Trend* variable has a negative effect for developed countries. The interaction term $D02 * Trend$, however, is significantly positive, and mitigates the overall negative trending effect. The "going global" policy appears to be an across-the-board strategy to promote China's ODI and benefits both developing and developed countries.

In passing, we note that the inclusion of interaction variables does not have a qualitative impact on other coefficient estimates for either developing or developed countries.

3.2 An Extended Specification

In this subsection, we augment specification (1) with three variables that are deemed relevant for China's overseas investment policy. The three variables are China's exports to the host country, China's level of international reserves, and the existing level of investment in the host country. The first two variables reflect the push effects derived from China's own policies and the last one is related to the agglomeration or herding phenomenon.

Over time, China's share of overseas investment in the trade and trade services sector has increased, which includes a) wholesale and retail operations, and b) business, transportation and storage services

that handle China's exports. Indeed, by the end of 2005, 61.2% of China's ODI stock was in this sector. Apparently, a component of China's overseas investment policy is to go with its exports. After the Asian financial crisis, for instance, China issued a directive that encourages ODI projects, which promote its exports. To investigate the implication of China's export activity, we construct a variable *XShare*, which is given by Chinese exports to the host-country normalized by the world's total exports to the host-country. We expect the variable to have a positive coefficient if (part of) ODI is deployed to service exports.[12] The trade data were retrieved from the *Directions of Trade* database provided by the International Monetary Fund.

The rapid accumulation of international reserves, especially during the new millennium, has created some policy issues for the Chinese authorities. Some countries – the US may be the most vocal one – have criticized China for hoarding an excessive amount of international reserves and, thus, creating severe global imbalances. Excessive international reserves are also a potential source of domestic economic turmoil. Recently, the Chinese government has pursued a number of initiatives to alleviate the adverse effect of a high level of international reserves. One initiative is to encourage both state-owned and private enterprises to invest abroad via ODI and portfolio investment. Other initiatives include allowing Chinese corporations to keep overseas earnings outside China and setting up a sovereign wealth fund to manage part of its international reserves. To investigate the effect of China's international reserve holding on its ODI, we consider the variable *Reserve*, given by the ratio of China's total international reserves to its gross domestic product. The data on international reserves are taken from the *World Development Indicators* database.

The third variable captures the so-called agglomeration effect. Krugman (1997), for example, points out that FDI tends to follow previous investment. Facing uncertainties, investors infer direct and indirect signals from past decisions made by other investors in foreign countries. If an investor sees his country already has a considerable amount of investment in a foreign country, then he is likely to invest in that country – either to take advantage of experiences accumulated by his peers or set up his business among people with whom he is familiar.[13] To capture the effect of mimicking previous investment decisions, we introduce the ratio of China's ODI to a host country to China's total ODI and label it *Aggl.* Under the agglomeration hypothesis, *Aggl* is expected to have a positive coefficient; that is, a host country that already has a large share of China's ODI is likely to attract new Chinese capital.

[12] Lipsey and Weiss (1984) and Eaton and Tamura (1994) report the complimentary relationship between FDI and exports. In the current study, we use the lagged *XShare* variable in the regression analysis to isolate the *XShare* effect.

[13] In the literature, reasons for agglomeration include knowledge spillovers, advantage of specialized factors, and linkages between customers and suppliers (Krugman, 1997; Krugman and Venables, 1995, 1996). See, also, Head *et al.* (1995) and Wheeler and Mody (1992).

With the three added explanatory variables, equations (1) and (2) are modified to

$$ODI_{i,t} = \alpha + \mu_i + \beta_1 GDP_{i,t-1} + \beta_2 RGDPpc_{i,t-1} + \beta_3 GDPG_{i,t-1} + \beta_4 Wage_{i,t-1} + \beta_5 Raw_{i,t-1} + \beta_6 Risk_{i,t-1} + \beta_7 Trend_t + \gamma_1 XShare_{i,t-1} + \gamma_2 Reserve_{t-1} + \gamma_3 Aggl_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

and

$$\begin{aligned} ODI_{i,t} = {} & \alpha + \mu_i + \beta_1 GDP_{i,t-1} + \beta_2 RGDPpc_{i,t-1} + \beta_3 GDPG_{i,t-1} + \beta_4 Wage_{i,t-1} + \\ & \beta_5 Raw_{i,t-1} + \beta_6 D98_t * Raw_{i,t-1} + \beta_7 D02_t * Raw_{i,t-1} + \beta_8 Risk_{i,t-1} + \\ & \beta_9 Trend_t + \beta_{10} D98_t * Trend_t + \beta_{11} D02_t * Trend_t + \\ & \gamma_1 XShare_{i,t-1} + \gamma_2 D98_t * XShare_{i,t-1} + \gamma_3 D02_t * XShare_{i,t-1} + \\ & \gamma_4 Reserve_{t-1} + \gamma_5 D98_t * Reserve_{t-1} + \gamma_6 D02_t * Reserve_{t-1} + \\ & \gamma_7 Aggl_{i,t-1} + \gamma_8 D98_t * Aggl_{i,t-1} + \gamma_9 D02_t * Aggl_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

The results of estimating (3) and (4) are presented in Tables 3 and 4. Given the significance of interaction terms, we make only a few brief remarks on Table 3 and offer a more detailed discussion of Table 4. In Table 3, with the exception of the *XShare* variable for developed countries, the three added variables are all positively significant. The inclusion of these three variables improves the overall performance of the model; the estimated models have a noticeable increase in their adjusted R-squares estimates. The results attest to the relevance of these factors in determining China's overseas investment decisions.

The interaction variables in Table 4 offer some specific information about the effects of the three added variables. Again, the differences between the results for developed and developing countries are quite obvious. The results pertaining to *XShare*, *D98* XShare*, and *D02* XShare* indicate that the share of Chinese exports displays a strong positive effect after the Asian financial crisis for developing countries but an insignificantly negative effect for developed countries. The positive effect has gained further momentum since 2002.

The differential *XShare* effect is likely attributable to market structures and channels through which China exports its goods and services. Conceivably, China does not have to spend much effort in servicing its exports to developed countries, which usually have a relatively good infrastructure and distribution network. Further, China's exports to developed countries are usually procured by big corporations (e.g. Wal-Mart in the US). On the other hand, given their relatively remote market conditions, China has to

invest to penetrate markets in developing countries.[14] This suggests that ODI has to be deployed to support and service exports to developing countries and, thus, ODI increases with the trade share. Further, the presence of a significant *XShare* effect coincides with the policy changes discussed earlier.

The interaction variable *D02*Reserve* isolates the significant effect of international reserves in the post-2002 period for the whole sample and the subsample of developed countries. The result corroborates the view that China's rapid build-up of international reserves makes the "promotion of outward FDI an imperative for the Chinese Government" (UNCTAD, 2006, p. 55). The international reserves factor, however, has only tangential implications for decisions on investing in developing countries. The developing countries have positive coefficient estimates for *D98*Reserve* and *D02*Reserve*, but these estimates are not statistically significant.

The agglomeration variables *Aggl, D98*Aggl*, and *D02*Aggl* show an interesting pattern. The significantly positive *Aggl* indicates that, in general, the Chinese overseas investment tends to follow the footsteps of previous decisions – the host-country that has a larger share of China's ODI tends to receive more Chinese capital. It is true for both developed and developing countries despite the difference in the magnitudes of the effect.

Since the Asian financial crisis, there seems to have been a policy shift. For developing countries, the agglomeration or herding behaviour has been weakened since 1998 – both *D98*Aggl* and *D02*Aggl* have a significantly negative coefficient estimate. Indeed, the combined effect of *Aggl, D98*Aggl*, and *D02*Aggl* is quite close to zero. In checking the data, it is found that, between 1991 and 2005, the number of developing countries receiving China's ODI increased quite steadily – 85 in 1991, 124 in 1997, 134 in 2001, and 147 in 2005. Further, in plotting the data we observe that the ODI distribution across the 38 recipient countries (Hong Kong and Macau are not included) in the sample is spreading out over time.[15] While increasing its presence in developing countries, China is spreading its investment across these countries. Instead of agglomerating its investment, China appears to be diversifying and spreading its investment across these developing countries.

The developed countries reveal a different picture. The *D98*Aggl* variable is still significantly positive and the *D02*Aggl* variable is negative but insignificant. Thus, the Chinese capital further clusters among developed countries that already have a large share of China's ODI in the post-Asian financial crisis period. Even though the interaction variable *D02*Aggl* is not significant, the sign of its coefficient estimate indicates that there is a change in the dynamics. Indeed, the plots of ODI show that, across the 10 developing countries in the sample, the distribution is quite stable between 1991 and 2001 and displays a

[14] Indeed, for developed countries, the correlation between China's *ODI* and *XShare* is at a rather weak level of 0.125 and, for developing countries, the correlation is 0.565.

[15] These plots and those for developed countries discussed later are given in Appendix A.

higher degree of dispersion in 2005. Using the sum of the coefficient estimates of *Aggl, D98*Aggl* and *D02*Aggl* to gauge the overall effect, we see that the agglomeration effect went up in the post-1997 period and then roughly reversed back to its previous level after 2002. Thus, at the end of our sample period, agglomeration is still a relevant element for making ODI decisions in developed countries but not for ODI decisions in developing countries.

In passing, we note that the inclusion of *XShare*, *Reserve*, *Aggl* and the related interaction variables has some implications for the coefficient estimates reported in Table 2. For developing countries, $RGDP_{pc}$ becomes significantly positive, *Raw* insignificant, and *D98*Trend* insignificant. For developed countries, the coefficient estimates of $RGDP_{pc}$, *Wage*, *D02*Raw*, *Risk*, and the trend related variables experience changes. One impression is that the *Trend* and the related interaction variables are playing a less important role in the presence of the added economic variables.

4. Additional Analyses

4.1 Natural Resources Seeking Motive

China's (attempted) acquisitions of operations in the area of natural resources have drawn considerable attention from the media and policy circle. Strong economic growth is the main driver behind China's move to secure raw materials and oil around the world. As a relatively new outward investor in natural resources, it is not easy for China to set up its foothold in established and conventional locations. Indeed, China is perceived to direct its investment to geographically and/or politically sensitive regions, including Africa, for natural resources. Such a natural resources procurement policy is deemed to be aggressive and can alter the global economic and political balances.[16]

We investigate whether China's ODI is overwhelmingly geared towards natural resources in Africa and in oil-producing countries. To proceed, we drop the *Wage* variable and introduce a few interaction dummy variables. By dropping the *Wage* variable, we have 10 instead of 2 African countries in the analysis. The zero-one dummy variables *DAfr* and *DOil* are constructed for the African and oil-producing countries. The *Fuelx* variable given by the ratio of a host-country's fuel exports to its total merchandise exports is included as an alternative to the aggregate resource variable *Raw*. The interaction variables *Raw*DAfr*, *D98*Raw*DAfr*, and *D02*Raw*DAfr* are used to examine the behavior towards natural resources in African countries. The interaction variables *Fuelx*DOil, D98* Fuelx*DOil*, and *D02*Fuelx*DOil* are used to

[16] For instance, there are concerns about China's "predation" of Africa's oil resources and the so-called "economic colonialism" (People's Daily Online, 2006). For alternative views on Sino-African relationships, see Downs (2007), Evans and Downs (2006), and Wang (2007). To be sure, there is a general concern about the increasing procurement of natural resources from emerging markets (The Economist, 2006). UNCTAD (2006), for example, examines the increase in FDI from developing economies.

assess results specific to oil-producing countries. The fuel seeking motive in Africa is studied using *Fuelx*DAfr, D98* Fuelx*DAfr* and *D02*Fuelx*DAfr*.

Table 5 reports the effects of these interaction dummy variables. The results of adding *Raw*DAfr*, *D98*Raw*DAfr*, and *D02*Raw*DAfr* to (and excluding *Wage* from) equation (4) are presented under the column labeled "African." Among the three added variables, *Raw*DAfr* and *D98*Raw*DAfr* are significant with different signs. The negative coefficient estimate of *Raw*DAfr* is inconsistent with the perception that China goes to Africa for natural resources. *D98*Raw*DAfr*, on the other hand, has a positive coefficient. The result is indicative of the possibility that China has been playing catch-up in procuring natural resources and the investment in Africa has been shifted towards countries with rich raw materials since 1998. The overall effect as given by the sum of the coefficient estimates of *Raw*DAfr* and *D98*Raw*DAfr*, however, is still negative. Even though the adjusted R-squares estimate is not directly comparable to the one in Table 4 because of the difference in sample sizes and the exclusion of the *Wage* variable, it is noted that the estimate is smaller in Table 5.

The column labeled "Fuel/African" gives the results when the *Raw* variable is replaced by the variable *Fuelx*. The significance of the *Fuelx* variable supports the view that fuel procurement is a factor determining China's ODI activity. However, the motive is not getting stronger over time – in fact the interaction variable *D98* Fuelx* is significantly negative, indicating a weakening effect.

Interestingly, *Fuelx*DAfr* assumes a significantly negative coefficient estimate and *D98* Fuelx*DAfr* has a significantly positive one – the sum of the two coefficient estimates is negative. The evidence, again, does not square with the perception that China goes to Africa for natural resources – in this case, for fuel.

The column labeled "Fuel/Oil-producing" is a variation of the one labeled "Fuel/African" with *DAfr* replaced by the *DOil* dummy variable. Interchanging these two dummy variables does not alter the corresponding coefficient estimates qualitatively. Similar to the case of African countries, the results do not support the view that there is a "disproportionately" large amount of China's capital that targets the natural resource "fuel" in oil-producing countries.

In sum, there is only limited evidence that the exports of natural resources from the African and oil-producing countries attract an extra amount of direct investment from China. China's ODI in African and oil-producing countries does not appear overly tilted towards natural resources. The natural resources seeking motive, apparently, is just one of many reasons to invest in these countries. Indeed, the ODI interests of the Chinese enterprises extend beyond resources and energy projects – the top attractive areas are manufacturing, information technology products and services, and trading (Asia Pacific Foundation of Canada, 2005, 2006).

There is a caveat. While the coefficient estimates of *Fuelx*DAfr* and *Fuelx*DOil* are negative, those associated with the *D98* and *D02* interaction variables are positive. An alternative interpretation of these findings is that China is catching up with its natural resources seeking ODI projects in these countries. Our sample period ends at 2005 and does not reflect the most recent Chinese efforts to secure natural resources that have received considerable media attention. In this case, more data are required to determine the behavior of China's ODI in these countries.

4.2 Excluding the Wage Variable

The paucity of data on *Wage* imposes the most binding restriction on the country sample used in Section 3. The constraint mainly affects the number of developing countries. If we drop the *W*age variable, then we add 12 more developing countries to the sample. Table 6 gives the results of estimating equation (4) with the extended sample without the *Wage* variable.

For brevity, the results for the developed countries are not reported because, as expected, they are very similar to those in Table (4). Some changes for the results pertaining to data from developing countries are noted: *D02*RAW* becomes insignificant, *D98*Xshare* is still positive but insignificant, *D98*Reserve* becomes significant, and *D02*Trend* loses its significance. These changes, however, do not substantially alter the general picture of the behavior of China's ODI.

4.3 Alternative Sources of ODI data

Since 2003, China has published ODI data according to the IMF-OECD format. At the time of preparing the current study, these IMF-OECD style data are available for three years; namely 2003, 2004, and 2005.

The results of fitting these data to equation (3) are presented in Panel A of Table 7. Most of the estimates are insignificant. It is noted, however, that the number of observations is quite small. Again, the sample size is limited by the paucity of data on *Wage*. Similar to what we did in the previous subsection, we increased the country sample by excluding the *Wage* variable. In view of the limited time dimension of the dataset, we further dropped the insignificant *Trend* variable. The results estimated from the expanded sample are given in Panel B. The whole sample gives a significantly positive *GDP* effect. Similar to Table 3, the *XShare*, *Reserve*, and *Aggl* variables have a positive impact on China's ODI. The results for developing and developed countries are also comparable to those in Table 3 – the main exception is that, for developed countries, the *Reserve* variable has a negative, though insignificant, estimate.[17]

In passing, we mention that we also estimated equation (4) using China's ODI data that are reported by the receiving OECD countries and available from the *SourceOECD* database. Due to data limitations, we

ended up with 7 developed and 3 developing countries in the sample. We deemed the number of developing countries to be too small to reveal cross-country variations and, thus, used only data from developed countries. The estimation results, which are available from the authors, are similar to those for developed countries reported in Table 4. The main differences are, for these selected OECD developed countries, a) the *Wage*, *D98*Reserve*, and *D02*AggI* variables are statistically significant, and b) the *GDPG* variable is significantly negative.

In sum, the estimates derived from these two alternative sources of China's ODI data are quite comparable, even though not identical, to those from the official data on approved ODI. Specifically, the variables *XShare*, *Reserve*, and *AggI*, and their interaction terms display very similar effects in these regressions. In passing, we note that the UNCTAD *World Investment Report* is another FDI data source; nonetheless, we did not obtain the host-country specific data.

5. Concluding Remarks

There is a plethora of studies on China as one of the top recipients of international capital. At the same time, the role of China as a global capital provider has received little attention. Admittedly, China's overseas investment is quite small compared with both the size of its economy and the investment levels of other top outward investors. China's ODI, nonetheless, has been growing quite rapidly in the last few years. In 2005, China ranked 27th among all the outward investors and 4th among developing countries excluding offshore finance centers (UNCTAD, 2006) and was perceived that it would be an important source of financing for developing countries in the near future. Thus, it is of both academic and policy interest to systematically examine China's ODI behavior.

In this exercise, we investigate the empirical determinants of China's ODI. The determinants include those drawn from extant theory on overseas investment and those deemed relevant to China's circumstances. We also anticipate that China's investments in developed and developing countries are driven by different (policy) factors.

The empirical findings confirm that China displays different types of investment behavior across developed and developing countries. Subject to the differences between developed and developing countries, the results suggest a) the presence of the market seeking and resources seeking motives, b) the Chinese exports to developing countries tend to induce China's ODI, c) the recent surge in the Chinese holding of foreign exchange reserves promotes its ODI in developed countries, and d) the Chinese capital displays different types of agglomeration behavior across developed and developing countries. The interaction variables included in the regression analysis attest to the changes in China's

[17] Cheng and Ma (2009) fits a gravity-type equation to these three years of data. Note that the country-specific dummy variables in our specification capture time invariant effects.

overseas investment policy. We do not find substantial evidence that China mainly invests in African and oil-producing countries for natural resources. Even though it is encouraging to observe that alternative ODI data sources yield similar results, we are aware of the uncertainty about the quality of China's ODI data.[18] By and large, the empirical results illustrate the relevance of both standard ODI determinants and some China specific factors.

The global economy is feeling the impact of China's re-emergence. Besides its production and trade prowess, China is strengthening its outward investment activity. As a relatively new outward investor, China's direct investment abroad is relatively small. According to the 2005 UNCTAD's *Outward FDI Performance Index*, China ranked 71st in the world.[19] With its huge trade surplus and holding of international reserves, however, China has great potential to expand its outward investment activity.

There are clues that China is actively promoting its investment activity abroad. In addition to the "going global" policy, China is posed to increase its portfolio investment capacity in overseas markets. For instance, the recently implemented qualified domestic institutional investors (QDII) program is a controlled measure that allows Chinese citizens to invest in overseas equity markets. Another sign of China's intent to promote its outward investment is the establishment of the sovereign wealth fund – China Investment Corp. Very likely, China's overseas portfolio investment will make its presence known in the global financial market in the near future. When more data on portfolio investment are available, it will be of interest to assess China's overseas investment policy using data on both ODI and portfolio investment.

[18] To be fair, there is a general concern about the quality of statistics on FDI from developing and transition countries (UNCTAD, 2006).

[19] The index compares an economy's share of world outward FDI against its share of world GDP. The *Inward FDI Performance Index* is defined in a similar manner using inward FDI. In 2005, China ranked 55 according to the *Inward FDI Performance Index* ((UNCTAD, 2006).

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Table 1. Determinants of China's Overseas Direct Investment

	Whole	Developing	Developed
GDP	0.3400***	-0.3952	0.3414**
	(0.1229)	(0.6569)	(0.1527)
RGDPpc	-0.1158**	-0.0646	-0.2653***
	(0.0537)	(0.0481)	(0.0716)
GDPG	-0.0081	-0.0018	-0.0062
	(0.0096)	(0.0104)	(0.0319)
Wage	-0.0005***	-0.0004***	0.0033***
	(0.0002)	(0.0001)	(0.0012)
Raw	0.0432***	0.0380***	0.0904 *
	(0.0139)	(0.0126)	(0.0473)
Risk	-0.0055	0.0009	-0.0142
	(0.0057)	(0.0040)	(0.0207)
Trend	1.5399***	1.7859***	-1.2333 *
	(0.3743)	(0.4261)	(0.6693)
Adj. R-squares	0.2469	0.4211	0.2168
Observations	367	234	133

Note: The table reports the results of estimating equation 1). The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" and "Developed" columns, respectively, give results based on data from developing and developed countries. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 2. Determinants of China's Overseas Direct Investment, with Interaction Variables

	Whole	Developing	Developed
GDP	0.2171**	-0.3488	0.2650 *
	(0.1052)	(0.6454)	(0.1426)
RGDPpc	-0.0435	-0.0337	-0.2751***
	(0.0440)	(0.0333)	(0.1028)
GDPG	0.0038	0.0094	0.0203
	(0.0076)	(0.0099)	(0.0270)
Wage	-0.0007***	-0.0006***	0.0061***
	(0.0001)	(0.0001)	(0.0010)
Raw	0.0438**	0.0410**	0.0494
	(0.0176)	(0.0178)	(0.0466)
Risk	-0.0077	0.0023	-0.0136
	(0.0058)	(0.0055)	(0.0133)
*D98*Raw*	0.0007	0.0039	-0.0138
	(0.0140)	(0.0163)	(0.0295)
*D02*Raw*	-0.0124 *	-0.0125 *	0.1023 *
	(0.0073)	(0.0067)	(0.0551)
Trend	0.8445***	0.9698***	-2.6607**
	(0.2233)	(0.2883)	(1.1476)
*D98*Trend*	0.0955***	0.1231**	0.0483
	(0.0366)	(0.0584)	(0.0664)
*D02*Trend*	0.3038***	0.2859***	0.2282 *
	(0.0510)	(0.0625)	(0.1288)
Adj. R-squares	0.3721	0.4500	0.5156
Observations	367	234	133

Note: The table reports the results of estimating equation (2). The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" and "Developed" columns, respectively, give results based on data from developing and developed countries. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 3. An Augmented China's Overseas Direct Investment Specification

	Whole	Developing	Developed
GDP	0.0619	0.3330	0.3826 *
	(0.0806)	(0.4560)	(0.2239)
RGDPpc	0.0236	0.0762 *	-0.3606
	(0.0319)	(0.0407)	(0.2335)
GDPG	-0.0121	-0.0078	-0.0169
	(0.0084)	(0.0092)	(0.0256)
Wage	-0.0004***	-0.0002**	0.0019 *
	(0.0001)	(0.0001)	(0.0011)
Raw	0.0234 *	0.0207 *	0.0542
	(0.0120)	(0.0117)	(0.0465)
Risk	-0.0150***	-0.0037	-0.0302
	(0.0057)	(0.0055)	(0.0222)
Trend	1.2576***	2.1429***	-2.5160
	(0.2449)	(0.3397)	(2.0855)
XShare	5.3420**	5.3375**	-38.6226
	(2.2803)	(2.5362)	(35.3132)
Reserve	5.3169***	2.9204 *	7.1587***
	(1.2463)	(1.5655)	(1.8873)
Aggl	4.5294***	4.7214***	10.2120***
	(1.1910)	(1.8053)	(3.8470)
Adj. R-squares	0.4051	0.6161	0.4037
Observations	376	243	133

Note: The table reports the results of estimating equation (3), which includes the augmented variables *XShare, Reserve, and Aggl*. The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" and "Developed" columns, respectively, give results based on data from developing and developed countries. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 4. An Augmented China's Overseas Direct Investment Specification, with Interaction Variables

	Whole	Developing	Developed
GDP	0.1673 *	0.0455	0.1549 *
	(0.0954)	(0.4869)	(0.0889)
RGDPpc	-0.0087	0.0924***	-0.2350
	(0.0365)	(0.0347)	(0.2004)
GDPG	-0.0074	0.0087	0.0186
	(0.0082)	(0.0103)	(0.0291)
Wage	-0.0005***	-0.0005***	0.0011
	(0.0001)	(0.0001)	(0.0022)
Raw	0.0305 *	0.0115	0.0441
	(0.0178)	(0.0169)	(0.0713)
*D98*Raw*	-0.0019	0.0115	0.0226
	(0.0181)	(0.0147)	(0.0381)
*D02*Raw*	-0.0211***	-0.0148 **	-0.0327
	(0.0074)	(0.0071)	(0.0436)
Risk	-0.0025	-0.0023	-0.0542 **
	(0.0057)	(0.0062)	(0.0254)
Trend	0.8560***	1.0153***	-1.1266
	(0.2956)	(0.2792)	(2.3934)
*D98*Trend*	0.0316	0.0256	0.4346 *
	(0.0496)	(0.0722)	(0.2620)
*D02*Trend*	0.0911	0.1164 *	0.0937
	(0.0621)	(0.0677)	(0.1650)
XShare	0.0683	-5.5738	-29.1614
	(3.5412)	(4.3088)	(30.9261)
*D98*XShare*	-2.3133	6.9324 **	-2.5050
	(1.5932)	(3.2317)	(6.7531)
*D02*XShare*	3.0170	10.2222***	-10.1022
	(3.2361)	(3.8911)	(11.6359)
Reserve	-0.1599	-0.7287	-0.6038
	(1.1056)	(1.7250)	(3.5593)
*D98*Reserve*	2.3706	2.0529	-9.4953
	(1.5576)	(2.0151)	(7.4216)
*D02*Reserve*	4.3220 **	1.9467	14.9865 *
	(1.7614)	(1.7768)	(8.8401)
Aggl	11.5792***	33.3347***	16.8765***
	(2.6537)	(8.5776)	(5.0529)
*D98*Aggl*	1.3921	-13.4679 **	6.6309 **
	(2.1282)	(6.3053)	(2.6525)
*D02*Aggl*	-9.9225***	-19.2420***	-8.3877
	(2.2906)	(5.5641)	(10.2744)
Adj. R-squares	0.5774	0.6973	0.5727
Observations	367	234	133

Note: The table reports the results of estimating equation (4), which includes the augmented variables *XShare, Reserve, Aggl*, and the related interaction terms. The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" and "Developed" columns, respectively, give results based on data from developing and developed countries. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 5. Natural Resources Seeking in African and Oil-Producing Countries

African		Fuel/African		Fuel/Oil-Producing	
GDP	0.2014 * (0.1096)	*GDP*	0.2146** (0.1079)	*GDP*	0.1626 * (0.0973)
RGDPpc	-0.0375 (0.0297)	*RGDPpc*	-0.0365 (0.0296)	*RGDPpc*	-0.0359 (0.0283)
GDPG	-0.0020 (0.0062)	*GDPG*	-0.0032 (0.0061)	*GDPG*	-0.0026 (0.0060)
Raw	0.0165 (0.0133)	*Fuelx*	0.0299*** (0.0110)	*Fuelx*	0.0781*** (0.0248)
*D98*Raw*	-0.0044 (0.0042)	*D98*Fuelx*	-0.0073** (0.0034)	*D98*Fuelx*	-0.0337** (0.0132)
*D02*Raw*	0.0002 (0.0035)	*D02* Fuelx*	0.0016 (0.0034)	*D02* Fuelx*	-0.0011 (0.0125)
*Raw*DAfr*	-0.0439 * (0.0232)	*Fuelx *DAfr*	-0.0547** (0.0225)	*Fuelx *DOil*	-0.0742*** (0.0249)
*D98*Raw*DAfr*	0.0320** (0.0155)	*D98* Fuelx *DAfr*	0.0301** (0.0122)	*D98* Fuelx *DOil*	0.0289** (0.0122)
*D02*Raw*DAfr*	-0.0022 (0.0076)	*D02* Fuelx *DAfr*	0.0066 (0.0136)	*D02* Fuelx *DOil*	0.0040 (0.0121)
Risk	-0.0073 * (0.0044)	*Risk*	-0.0085** (0.0040)	*Risk*	-0.0067 (0.0047)
Trend	0.9938*** (0.1759)	*Trend*	0.9779*** (0.1686)	*Trend*	0.9080*** (0.1653)
*D98*Trend*	-0.0389 (0.0500)	*D98*Trend*	-0.0333 (0.0494)	*D98*Trend*	-0.0547 (0.0473)
*D02*Trend*	0.0792 * (0.0490)	*D02*Trend*	0.0784 * (0.0472)	*D02*Trend*	0.0845 * (0.0469)
XShare	4.5732 (3.5319)	*XShare*	5.1147 (3.1816)	*XShare*	4.8425 (3.4409)
*D98*XShare*	-2.7951 (1.7547)	*D98*XShare*	-3.3744** (1.6545)	*D98*XShare*	-3.5266 * (1.8306)
*D02*XShare*	2.0866 (2.6588)	*D02*XShare*	3.6463 (2.5921)	*D02*XShare*	1.8546 (2.8449)
Reserve	1.0120 (1.0004)	*Reserves*	0.9415 (0.9567)	*Reserves*	0.6351 (1.1146)
*D98*Reserve*	2.4220** (1.1927)	*D98*Reserves*	3.2937*** (1.2255)	*D98*Reserves*	4.1078*** (1.3146)
*D02*Reserve*	1.5771 (1.4949)	*D02*Reserves*	0.4491 (1.5061)	*D02*Reserves*	0.6526 (1.4781)
Aggl	12.4068*** (2.1806)	*Aggl*	12.5090*** (2.0610)	*Aggl*	10.3204*** (2.3113)
*D98*Aggl*	-0.3648 (1.7378)	*D98*Aggl*	-0.9203 (1.6283)	*D98*Aggl*	0.3594 (1.8475)
*D02*Aggl*	-8.4658*** (2.2540)	*D02*Aggl*	-8.6840*** (2.1686)	*D02*Aggl*	-6.6989*** (2.5363)
Adj. R-squares	0.5556	Adj. R-squares	0.5859	Adj. R-squares	0.5536
Observations	527	Observations	527	Observations	527

Note: The table assesses the China's motive of seeking natural resources via outward investment in African and oil-producing countries. See the text for the definitions of *DAfr*, *DOil*, *Fuelx,* and the related interaction variables. The *Wage* is dropped to increase the sample size. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 6. The China's Overseas Direct Investment Equation without the *Wage* Variable

	Whole	Developing
GDP	0.2220**	0.3480
	(0.1104)	(0.5036)
RGDPpc	-0.0418	0.0632**
	(0.0296)	(0.0273)
GDPG	-0.0012	0.0002
	(0.0060)	(0.0074)
Raw	0.0039	0.0002
	(0.0070)	(0.0068)
*D98*Raw*	-0.0026	-0.0004
	(0.0041)	(0.0053)
*D02*Raw*	-0.0014	0.0019
	(0.0036)	(0.0029)
Risk	-0.0058	-0.0034
	(0.0045)	(0.0055)
Trend	0.9099***	1.4316***
	(0.1797)	(0.2680)
*D98*Trend*	-0.0031	-0.0464
	(0.0470)	(0.0616)
*D02*Trend*	0.0766 *	0.0623
	(0.0439)	(0.0472)
XShare	4.7450	0.1625
	(3.4228)	(3.9274)
*D98*XShare*	-3.0119 *	3.6325
	(1.6808)	(2.3678)
*D02*XShare*	2.0761	4.7055 *
	(2.5941)	(2.8103)
Reserve	0.8875	0.2040
	(1.0084)	(1.4537)
*D98*Reserve*	2.3433**	3.3759**
	(1.2028)	(1.4744)
*D02*Reserve*	1.8503	-0.4168
	(1.4379)	(1.4534)
Aggl	12.6405***	27.3350***
	(2.2196)	(8.4307)
*D98*Aggl*	-0.7819	-9.8328**
	(1.7542)	(4.8429)
*D02*Aggl*	-8.3826***	-13.4451**
	(2.2825)	(6.2612)
Adj. R-squares	0.5515	0.6835
Observations	527	388

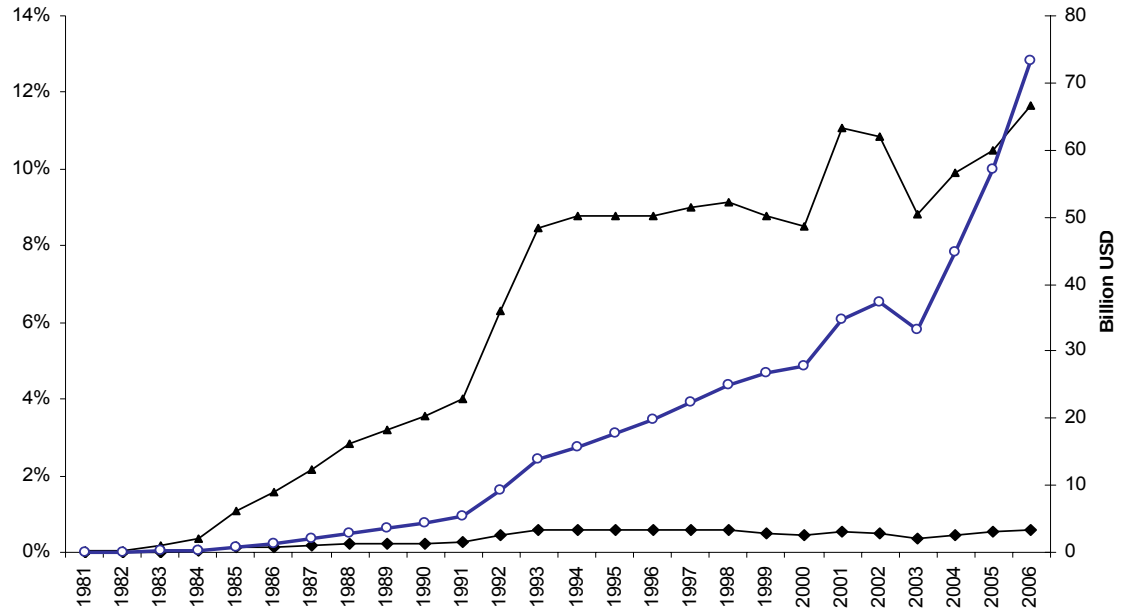
Note: The table reports the results of estimating equation (4) without the *Wage* Variable. The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" gives results based on data from developing. The results for developed countries are essentially the same as those in Table 2. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

Table 7. The China's Overseas Direct Investment Equation – An Alternative Data Source

	Whole	Developing	Developed
Panel A			
GDP	0.6389 *	18.2407	-0.5105
	(0.3662)	(16.3719)	(0.6355)
RGDPpc	-0.1774	-1.0379	-0.0491
	(0.1360)	(0.8254)	(0.2733)
GDPG	0.0701	0.0958	0.0297
	(0.0474)	(0.1052)	(0.1269)
Wage	0.0091	0.6601	0.0047
	(0.0098)	(0.7229)	(0.0057)
Raw	0.0432	-0.0148	0.0615
	(0.0320)	(0.0736)	(0.0760)
Risk	0.0813	0.1056	-0.0316
	(0.0528)	(0.0820)	(0.0556)
Trend	-0.5498	0.1236	0.1087
	(2.1802)	(4.9784)	(2.7544)
XShare	23.7449 **	32.5584 *	1.7704
	(8.4813)	(15.3697)	(22.2235)
Reserve	4.3335	1.5204	-0.9752
	(22.0537)	(50.1933)	(29.5455)
Aggl	19.8168 **	25.5190	549.1461 **
	(8.6648)	(13.3713)	(126.8308)
Adj. R-squares	0.7723	0.8014	0.9275
Observations	54	30	24
Panel B			
GDP	-0.0888	0.7725	0.2918
	(0.3817)	(4.7270)	(0.3098)
RGDPpc	0.2539 **	0.6038	-0.2636
	(0.1165)	(0.3814)	(0.1596)
GDPG	-0.0226	-0.0292 *	0.0157
	(0.0145)	(0.0154)	(0.0470)
Raw	-0.0027	-0.0023	0.0112
	(0.0053)	(0.0056)	(0.0207)
Risk	0.0510	0.0483	0.0263
	(0.0360)	(0.0420)	(0.0235)
XShare	25.1330 **	26.4219 **	12.4863
	(10.7382)	(12.3850)	(19.2589)
Reserve	7.6416***	8.2744***	-2.4844
	(2.0569)	(2.3969)	(3.9121)
Aggl	24.9875 **	22.5073 **	258.2925***
	(9.8843)	(9.8927)	(62.0990)
Adj. R-squares	0.4521	0.4448	0.8126
Observations	114	84	30

Note: The table reports the results of estimating equation (3) using three years of ODI data complied according to the IMF-OECD standard. Panel B excludes the *Wage* variables to increase the sample size. The insignificant *Trend* is also dropped. The column labeled "Whole" gives results based on data from both developing and developed countries. The "Developing" and "Developed" columns, respectively, give results based on data from developing and developed countries. See the text for detail. Robust standard errors are in the parentheses. "***", "**" and "*" denote significance at the 1%, 5% and 10% levels, respectively.

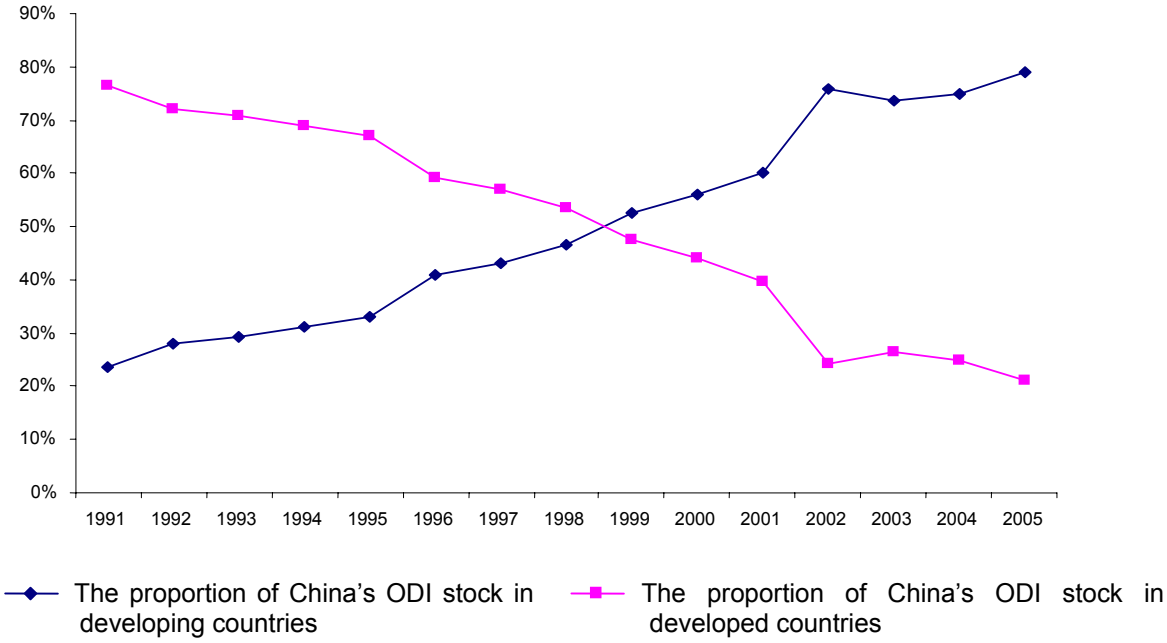
Figure 1. China's Overseas Direct Investment



- China's ODI as a percentage of the world total FDI
- China's ODI as a percentage of the total FDI from developing countries (excluding offshore financial centers including British Virgin Islands, Burmuda, Cayman Islands, Hong Kong, and Singapore)
- China's ODI stock (Right Axis)

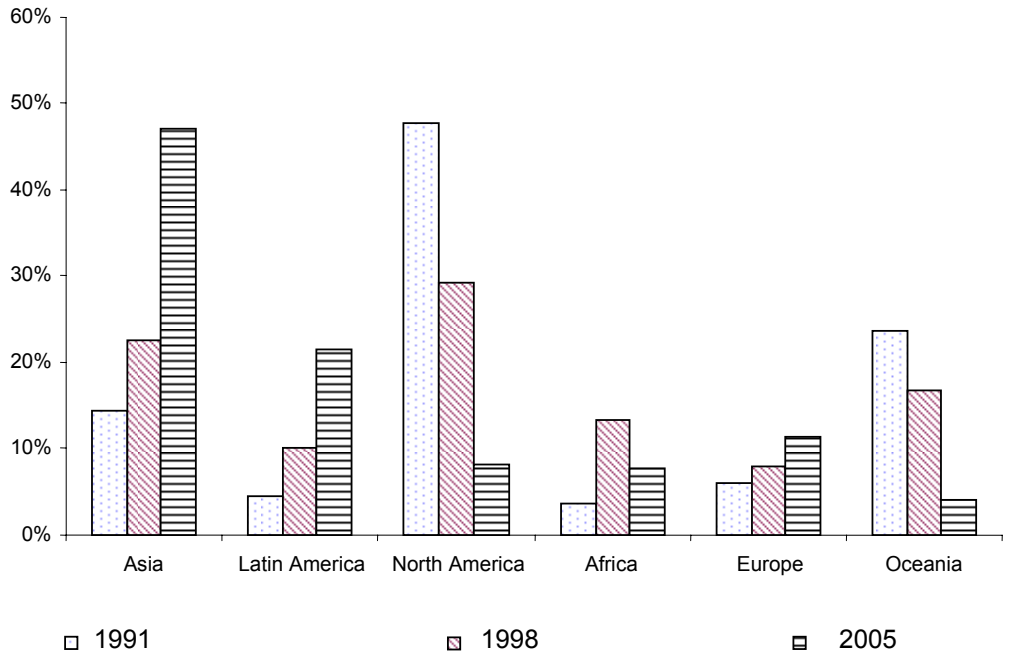
Note: Data are from UNCTAD (2006).

Figure 2. The Distribution of China's Overseas Direct Investment Among Developing and Developed Countries



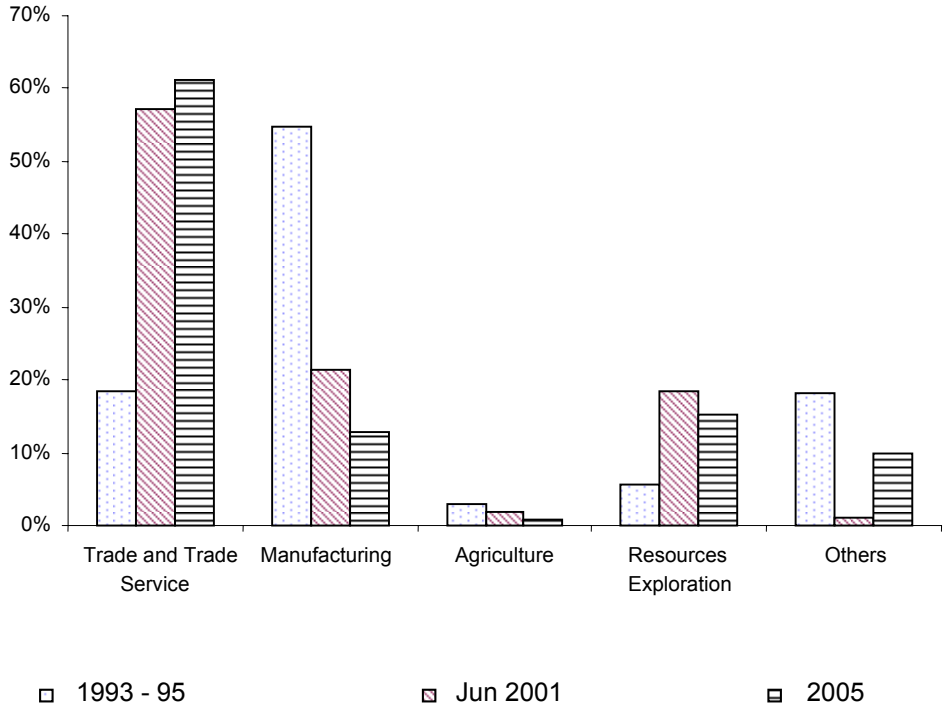
Note: Data are from the *Almanac of China's Foreign Economic Relations and Trade*, various issues

Figure 3. The Geographic Distribution of China's Stock of Overseas Direct Investment



Note: Data are from the *Almanac of China's Foreign Economic Relations and Trade*, various issues

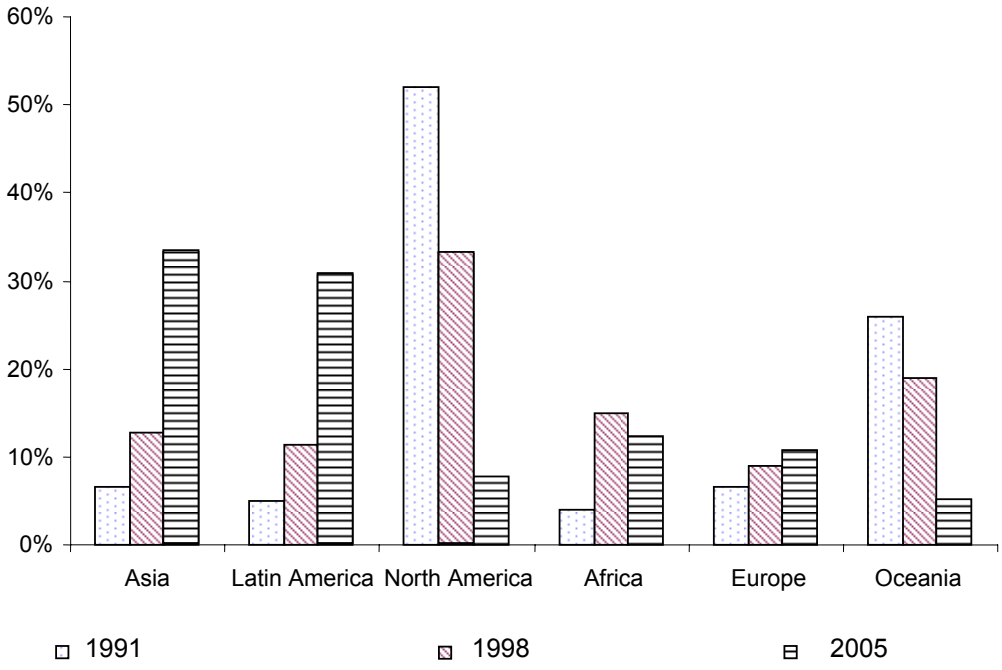
Figure 4. The Sectoral Distribution of China's Stock of Overseas Direct Investment



Note: The 1993-95 average data are from Lin (1997), the June 2001 data are from Guoji Shangbao (International Business Daily), Sept.7, 2001, and the 2005 data are from the 2005 Statistical Bulletin of China's Outward Foreign Direct Investment, the Ministry of Commerce, China.

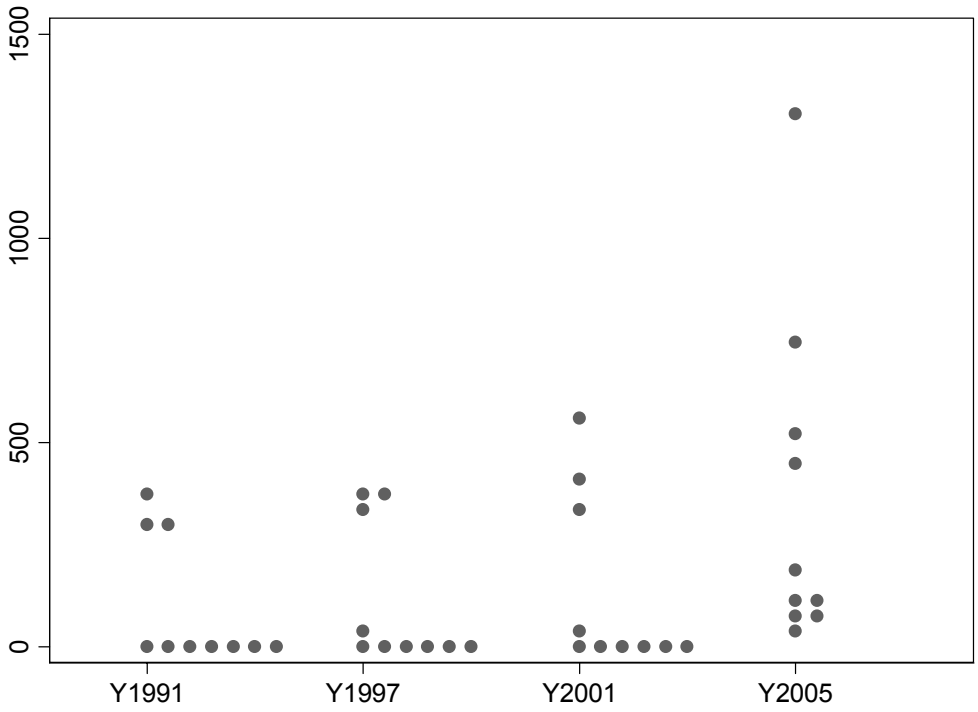
Appendix A. Additional Figures

Figure A.1. The Geographic Distribution of China's ODI Stock – Hong Kong and Macau Excluded



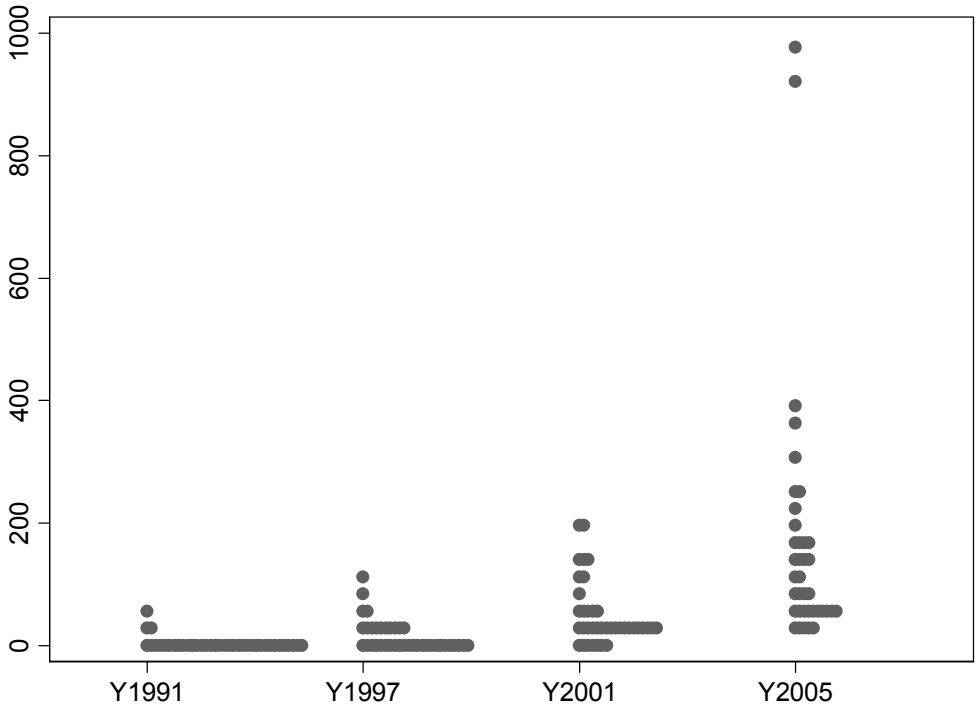
Note: Data are from *Almanac of China's Foreign Economic Relations and Trade*, various issues.

Figure A.2. The Distribution of China's ODI Stock Among the Top 10 Developed Countries



Note: 1) unit on the y-axis: million USD, and 2) one dot represents one country

Figure A.3. The Distribution of China's ODI Stock Among the Top 38 Developing Countries – Hong Kong and Macau Excluded



Note: 1) unit on the y-axis: million USD, and 2) one dot represents one country

Appendix B. Country Groupings

Countries in the sample are listed according to various grouping criteria.

B.1 Developing Countries:

Africa: Algeria, Gabon, Ghana, Guinea, Mali, Mauritius, Nigeria, South Africa, Sudan, Tanzania, Zambia;
East Asia: Cambodia, Hong Kong, Indonesia, Korea, Laos, Macau, Malaysia, Mongolia, Philippines, Singapore, Thailand, Vietnam;
Eastern Europe and Former Soviet Union: Kazakhstan, Kyrgyzstan, Poland, Romania, Russia;
Middle East: Egypt, United Arab Emirates, Yemen;
Oceania: Papua New Guinea;
Latin America: Argentina, Brazil, Chile, Mexico, Peru, Venezuela;
South Asia: India, Pakistan.

B.2 Developed Countries:

Australia, Canada, Denmark, France, Germany, Italy, Japan, New Zealand, the United Kingdom, the United States

B.3 Oil Exporters:

Algeria, Canada, Egypt, Gabon, Indonesia, Kazakhstan, Mexico, Nigeria, Russia, Sudan, United Arab Emirates, the United Kingdom, Venezuela, Yemen.

Appendix C. Variable Definition and Data Sources

ODI	China's approved outward direct investment scaled by the host country's population, in logs. [Source: Editorial Broad of the Almanac of China's Foreign Economic Relations and Trade (1992-2006)]
GDP	The ratio of host country's nominal GDP to China's nominal GDP in current US dollar. [Source: World Bank, World Development Indicators]
RGDPpc	The ratio of host country's real per capita GDP to China's in constant 2000 US dollar. [Source: World Bank, World Development Indicators]
GDPG	Host country's real GDP growth rate. [Source: World Bank, World Development Indicators]
Risk	The aggregated political risk index of each host country. The index comprises 12 components: government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, bureaucracy quality. [Source: The International Country Risk Guide]
Wage	The ratio of host country's average annual wage of manufacturing industries (ISIC 3) to China's. The wage data are converted into US dollar using average period exchange rate. [Source: The UN International labor Organization LABORSTA, Geneva and International Financial Statistics]
Fuelx	The share of fuels exports to total merchandise exports. [Source: World Bank, World Development Indicators]
Orex	The share of ores and metals exports to total merchandise exports. [Source: World Bank, World Development Indicators]
Raw	The share of raw material (including fuels, ores and metals) exports to total merchandise exports. [Source: World Bank, World Development Indicators]
XShare	China's exports to a country normalized by world's total export to the country. [Source: IMF Directions of Trade]
Aggl	The ratio of China's ODI stock in a host country to total China's ODI stock. [Source: Editorial Broad of the Almanac of China's Foreign Economic Relations and Trade (1992-2006)]
Trend	Time trend.
Reserve	China's total international reserves, including gold, scaled by China's nominal GDP (Current USD). [Source: World Bank, World Development Indicators]