



What determines Chinese outward FDI?

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ABSTRACT

Chinese outward foreign direct investment (FDI) has increased substantially in recent years. Though this has generated considerable interest in the motivations and drivers of Chinese investment abroad, there have been few systematic empirical studies of these questions. This paper performs an econometric analysis of the host country determinants of Chinese outward FDI in the period 2003–2006. We find that Chinese outward FDI is attracted to large markets, and to countries with a combination of large natural resources and poor institutions. Disaggregation shows that the former effect is related to OECD countries, whereas the latter interaction effect holds for non-OECD countries.

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1. Introduction

Is Chinese outward foreign direct investment (FDI) primarily drawn to poorly governed countries with abundant natural resources? In recent years, the Chinese financial presence globally has increased substantially, in terms of loans provided, investments made, and other types of flows. In particular, there has been a marked rise in outward Chinese foreign direct investment in recent years. This has spurred discussion and analyses of the motivation and implications of an increased Chinese presence, not least in developing economies. On the one hand, increased Chinese investment may be good for host countries, since more companies vie for locations and markets, and potentially expand opportunities for transfer of technology. On the other hand, however, concerns have been voiced that Chinese investment or financial flows more generally have contributed to propping up bad regimes in host countries, and have been conducted with a view to exploiting their natural resources. To borrow a headline from *The Economist*, is China simply “a ravenous dragon” or is there more to Chinese investment than this?²

Though Chinese outward FDI has generated considerable interest, concern and controversy, few empirical studies have been conducted to test the motives behind or consequences of the presence of Chinese multinationals in other countries. There is by now a large econometric literature on the host country determinants of FDI in general, which, if anything, suggests that FDI is attracted to countries with good institutions (Globerman &

Shapiro, 2002). Since FDI in general is dominated by flows from developed countries, it is an open question whether these results generalize to Chinese outward FDI. Moreover, there is an emerging literature on FDI flows from emerging economies that suggests that these flows may differ from those of developed economies (Filatotchev, Strange, Piesse, & Lien, 2007). Most studies of FDI related to China, have focused on China as a location for FDI from other countries, rather than as a source of FDI. To date there are only three econometric studies of the determinants of Chinese outward FDI that we are aware of, which present mixed results. Buckley et al. (2007) find that Chinese FDI is attracted to countries with bad institutions (high political risk), whereas Cheung and Qian (2008) find no significant effect of institutions. The latter study finds Chinese FDI to be attracted by natural resources, the former gets this result only for later time periods. A third study by Cheng and Ma (2008) does not include institutions nor resources as explanatory variables.

This paper presents new econometric results on the host country determinants of Chinese outward FDI, which significantly improve on previous studies. A main problem with the studies of Buckley et al. (2007) and Cheung and Qian (2008) is that their data on FDI captures approved investment, rather than actual investment.³ The results are therefore potentially biased, as investment that is publicly approved may be of a character different from investment decisions that are less visible. For instance, non-approved flows may reflect private investment decisions based on different objectives than government approved flows, or public

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² The Economist, March 15th 2008, Special report p. 3.

³ Approved investment numbers also did not include reinvested earnings, leading to serious underestimates of Chinese FDI (Cheng and Ma, 2008). Cai (1999) suggests that only 15–20% of actual financial outflows in the period up to the late-1990s were approved.

Table 1
Largest 15 host countries of Chinese outward FDI, 2003–2006 flows, current USD mill. and shares.

	2003	2004	2005	2006	Total 2003–2006	Share 2003–2006
Cayman Islands	806.61	1286.13	5162.75	7832.72	15088.21	0.39
Hong Kong, China	1148.98	2628.39	3419.7	6930.96	14128.03	0.37
British Virgin Islands	209.68	385.52	1226.08	538.11	2359.39	0.06
Korea, Republic of	153.92	40.23	588.82	27.32	810.29	0.02
Russian Federation	30.62	77.31	203.33	452.11	763.37	0.02
United States	65.05	119.93	231.82	198.34	615.14	0.02
Australia	30.39	124.95	193.07	87.6	436.01	0.01
Sudan		146.7	91.13	50.79	288.62	0.01
Germany	25.06	27.5	128.74	76.72	258.02	0.01
Algeria	2.47	11.21	84.87	98.93	197.48	0.01
Singapore	-3.21	47.98	20.33	132.15	197.25	0.01
Nigeria	24.4	45.52	53.3	67.79	191.01	0.00
Mongolia	4.43	40.16	52.34	82.39	179.32	0.00
Indonesia	26.8	61.96	11.84	56.94	157.54	0.00
Kazakhstan	2.94	2.31	94.93	46	146.18	0.00
Total (all countries)	2854.64	5498.01	12261.17	17633.97	38247.79	1.00

investment decisions reflecting motives a government may be reluctant to reveal, such as a drive for natural resources, or the exploitation of host countries with poor institutions. This paper uses more recent data on actual Chinese FDI flows, and therefore provides more reliable results on the impact of host country institutions and resources on Chinese investment. Moreover, previous studies have looked at institutions and natural resources in isolation, and not explored whether the two have a joint influence on Chinese FDI. By contrast, this study tests and finds of significant importance an interacted effect of institutions and resources, suggesting that Chinese investment is more attracted to a country with natural resources, the worse the institutional environment of that country. This result holds even when controlling for the stage of resource exploitation of host countries, which suggests that it is not due to China having only poorly governed countries left to invest in as a latecomer in foreign direct investment.

The paper is structured as follows. Section 2 provides a descriptive overview of Chinese FDI flows, and relates this to the existing empirical literature on the topic. Since there are suggestions that Chinese FDI reflects different motives than FDI generally, Section 3 reviews theoretical arguments as to why this may be the case, leading to a set of testable hypotheses relating to the impact of natural resources and institutions. Section 4 then presents the empirical strategy and the data of the paper. Results on the impact of institutions and natural resources on Chinese FDI are presented and discussed in Section 5, which also addresses the robustness of the results. Section 6 concludes the study.

2. Chinese outward FDI: Patterns and evidence

2.1. Descriptive overview of Chinese outward FDI

Outward foreign direct investment from China has increased considerably in recent years, and China is the source of FDI in a great number of host economies. While the open door policy in the late-1970s lead to modest outward FDI, the liberalization associated with Deng Xiaping's tour of South China in 1992, and the Go Global strategy initiated in 1999, lead to boosts in Chinese outward FDI. Outward FDI in recent years has increased substantially (Buckley et al., 2007; Cai, 1999; Cheng & Ma, 2008; Hong & Sun, 2006). While China accounted for 3.3% of total outward investments from developing countries in 1996, its share had risen to 10% in 2006. This makes China the 3rd largest developing country in terms of outward FDI (after Hong Kong and Brazil), up from 7th position in 1996. In global terms, however, China was only the 17th largest country in terms of outward FDI

flows in 2006, and small in comparison to the major industrialized economies.⁴

China started publishing outward FDI data consistent with OECD and IMF standards only in 2003 (Cheung & Qian, 2008). According to the data from UNCTAD used in this study, 142 countries received investment from China in the period 2003–2006. Table 1 presents the 15 largest host economies for Chinese FDI, as well as the total flows for the four years for which comprehensive data is available. As the bottom row of the table shows, total FDI from China has increased more than six times in current terms in the period 2003–2006. The far right column shows that the bulk of the investment, more than 80%, goes to offshore financial centres such as the Cayman Islands and the British Virgin Islands, and to Hong Kong. However, a number of other countries receive substantial amounts in absolute terms, this includes both OECD and non-OECD countries.

From a cursory inspection of the largest recipient countries, countries that are tax havens, geographically close to China, that are endowed with natural resources in the form of petroleum, or that represent large markets, appear to attract Chinese investment. A number of the largest host countries to Chinese FDI also have poor institutional records. Sudan, for instance, is among the 7–8 least democratic and most corrupt countries in the world, according to 2008 Freedom House and Transparency International indices.⁵ Table 2 breaks Chinese FDI into host regions, where the dominant flows are to Latin American and the Caribbean, and to Asia. Again these data reflect tax haven status or geographical vicinity. Interestingly, though receiving a small share of the total, Africa is host to more Chinese FDI than Europe, North America or Oceania.

As for sectoral composition, just over 40% of Chinese outward FDI flows in 2006 were in the mining and petroleum sector. Almost 54% was in various service industries (mainly business services and finance) and only 4% in manufacturing (Cheng & Ma, 2008). Though these proportions fluctuate from year to year, this again would seem to suggest that accessing large markets and natural resources are important aspects of Chinese outward FDI. It is likely that service industry investments gravitate more towards developed countries, and resource investment to developing countries. Unfortunately, currently available data do not permit cross-classification by industry and country, making it difficult to be more precise about sector distribution in individual regions or countries. However, we return to the question of distinctions in

⁴ See http://www.unctad.org/sections/dite_dir/docs/wir2008_outflows_en.xls.

⁵ See <http://www.freedomhouse.org/template.cfm?page=410&year=2008> and http://www.transparency.org/news_room/in_focus/2008/cpi2008/cpi_2008_table.

Table 2
Regional shares of Chinese outward FDI flows^a, 2003–2006.

	2003	2004	2005	2006	Total 2003–2006
Africa	0.03	0.06	0.03	0.03	0.03
Asia	0.53	0.55	0.37	0.44	0.44
Europe	0.05	0.03	0.03	0.03	0.03
Latin America and the Caribbean	0.36	0.32	0.53	0.48	0.46
North America	0.02	0.02	0.03	0.01	0.02
Oceania	0.01	0.02	0.02	0.01	0.01

^a Country classifications according to United Nations Statistics Division.

determinants between developed and developing countries in our analysis below.

While this descriptive overview of Chinese outward FDI flows is suggestive in terms of host country determinants, more systematic analysis is needed to establish the importance of resources, institutions, markets and other factors for FDI flows. To this end, we performed an econometric analysis of Chinese outward FDI. In doing so, the rather curious pattern of heavy FDI flows to tax havens represents a challenge. Several studies suggest that the investment of China in Hong Kong and tax havens reflect a phenomenon of “round-tripping”, whereby funds are moved abroad to take advantage of beneficial host country conditions. These funds are then re-invested in China to benefit from advantageous terms for foreign investors (Cheng & Ma, 2008; Cheng & Stough, 2007; Morck, Yeung, & Zhao, 2008; Yeung and Liu, 2008). Alternatively, these flows may represent the establishment of holding companies for investment elsewhere, or attempts to conceal wealth from tax authorities or other parties (Morck et al., 2008). Due to the inherent secrecy of these locations, the nature and ultimate destinations of FDI flows are difficult to discern (Cheng & Ma, 2008; Morck et al., 2008). For this reason, these flows likely reflect motives different from other FDI flows. Since data on key explanatory variables are not available for these locations, we exclude them in the subsequent analysis.

2.2. Evidence on Chinese outward FDI

Some systematic empirical evidence on host country determinants of Chinese FDI does exist. Given the increasing financial presence of China abroad, a number of studies have been published in recent years on Chinese FDI. Most of these present simple descriptive data on Chinese investment and/or theoretical arguments, some of which we will return to in the following section. Three econometric studies have to date been performed on data on Chinese FDI flows. While these studies suggest a number of relevant variables to include in our analysis, their results are mixed. They also have flaws in the data used and their specifications. These flaws need to be addressed.

Buckley et al. (2007) use panel data on approved Chinese FDI to 49 countries, for the period 1984–2001. They found that more Chinese investment goes to countries with poor institutions (proxied by an index of political risk), whereas natural resources (measured as the share of ores and metals exports in total merchandise exports) are insignificant in the full sample. Splitting the sample into two sub-periods, their results show that institutions are significant only in the period 1992–2001. Natural resources significantly attract Chinese FDI in this period. This suggests that these variables have become more important in more recent years following the liberalization associated with Deng Xiaoping’s South China Tour in 1992. For other variables, Buckley et al. find that Chinese FDI is attracted to countries with large GDP, high inflation, high exports and imports, and cultural proximity to China. Patents, exchange rates, distance from China and total FDI as a share of GDP, are found not to impact Chinese FDI.

Cheung and Qian (2008) similarly perform a fixed effect estimation, on data on approved Chinese FDI flows to 31 countries over the period 1991–2005. In their base specification, they found that institutions (measured as country risk) are insignificant, while natural resources (proxied as the ratio of fuels, ores and metals exports in total merchandise exports) significantly attract Chinese FDI. They also found that Chinese FDI is attracted by host country GDP and deterred by GDP per capita. Since both these are measured relative to Chinese GDP, this makes interpretation difficult. Moreover, low wages attract Chinese FDI. Cheung and Qian also reran their estimation on data on actual Chinese FDI for the years 2003–2005, getting few significant results, which is not surprising given the lack of temporal variation.

Finally, Cheng and Ma (2008) conducted an analysis on actual Chinese FDI data for 90 host countries over the period 2003–2006. Though panel data estimation is used, the exact method is not revealed in their paper. Their specification does not include institutions nor natural resources. For other variables, they find that GDP and cultural proximity to and a common border with China attract Chinese FDI. Distance from China and landlocked countries deter Chinese FDI.

In sum, previous empirical studies do not provide a clear picture of host country determinants of Chinese FDI. Their results suggest that poor institutions either attract or do not matter for FDI from China, and that natural resources either attract Chinese FDI or do not matter. As noted earlier, the two studies that include institutions and natural resources as explanatory variables use data on approved rather than actual FDI flows, which may produce biased results. The only study which uses data on actual FDI flows, does not include institutions nor natural resources among its explanatory variables. Our analysis addresses this lacuna by testing the impact of institutions and natural resources on actual Chinese FDI flows. There are also good theoretical arguments for adding the interaction of institutions and natural resources to the empirical specification, as discussed in the following section.

3. Is China different? Theoretical arguments

These studies suggest that Chinese investors may respond differently to host country factors than other investors, at least with respect to institutions. Theoretical studies argue that good host country institutions will reduce risk and costs of doing business and increase productivity (Blonigen, 2005), and hence attract FDI. Most recent empirical studies of total FDI flows also document a positive relationship to host country institutions (Asiedu, 2006; Gani, 2007; Globerman & Shapiro, 2002; Harms & Ursprung, 2002; Wei, 2000). While Bénassy-Quéré, Coupet, and Mayer (2007) argue that these studies do not control for endogeneity, we are not aware of any study suggesting that weak institutions increase total FDI inflows. While natural resources are one locational advantage in the OLI framework of Dunning (1977, 1993), their impact on total FDI has not been much examined empirically. Harms and Ursprung (2002) obtain mixed results for an oil dummy, and Asiedu (2006) finds resources significant for total FDI flows to African countries.

So is China different, and if so why? A number of different mechanisms may explain why Chinese investment may be particularly attracted to countries with natural resources, or a poor institutional environment. This section provides a theoretical analysis of possible reasons for this potential difference, leading to a set of testable hypotheses, which to some extent also permits distinction between different theoretical explanations of Chinese FDI patterns. From a theoretical perspective, two background characteristics of the Chinese economy can be distinguished which have implications for the relation of Chinese outward FDI to host country institutions, natural resources, and their interaction.

First, the Chinese companies that invest abroad are predominantly state-owned (SOEs). In 2006, 82% of China's non-financial outward FDI was conducted by state-owned enterprises (Yeung & Liu, 2008). Of the thirty largest companies ranked by outward FDI, all but two are state-controlled, and though most SOEs are listed on a stock exchange, the state retains majority power and appoints executives, largely from party ranks (Morck et al., 2008). This means that their investment decisions reflect political objectives, and not just profit-maximization as in the case of privately owned multinationals from other countries.⁶ In principle, such objectives may be to promote domestic development (Deng, 2004), ensure regime survival or increase the wealth or status of those in power (Morck et al., 2008), to support Chinese foreign policy, or promote host country development (Yeung & Liu, 2008). The latter objective would entail more Chinese FDI to poorer countries, which our empirical analysis does not confirm, and is hence unlikely to be of importance. Though some studies claim that Chinese FDI is becoming more commercial (Cheng & Stough, 2007; Hong & Sun, 2006), political objectives likely remain relatively more important than for multinationals from other countries. Even FDI by privately owned Chinese firms may to some extent reflect political objectives, due to the incentives they face when investing abroad (Cheng & Ma, 2008).

Second, in addition to reflecting different objectives, Chinese FDI may also reflect different opportunities or incentives than FDI from other countries. In particular, China has a quite different institutional environment than the major source countries of FDI from the developed world. The level of corruption in China is much higher than in the major industrialized source countries of FDI. Moreover, for those companies listed, China has much weaker stock market regulations than other countries. Only 15% of Chinese overseas listing is in the United States (Hung et al., 2008). A number of studies argue that home country institutions affect their competitive advantages (Belloc, 2006; Costinot, 2009; Levchenko, 2007). In terms of FDI, some studies suggest that investment patterns do not just reflect better or worse institutions, but also similarities in institutions between home and host country. For instance, Habib and Zurawicki (2002) find that greater absolute differences in corruption have a negative impact on bilateral FDI. The institutional setting in China may thus be an important determinant of the sectors and countries it invests in.

Accordingly, a number of studies of Chinese FDI suggest that Chinese companies have competitive advantages in countries with weak institutions. In contrast to companies from developed economies, Chinese companies are experienced in "navigating complex patron-client relationships and personal and institutional favours in relatively opaque and difficult business environments" and in "dealing with burdensome regulations and navigating around opaque political constraints" (Yeung & Liu, 2008:71; Morck et al., 2008:346). In this respect, Chinese firms face a lesser

"liability of foreignness" than do its Western counterparts (Child & Rodrigues, 2005; He & Lyles, 2008). Moreover, less stringent regulation of Chinese firms makes ethically questionable activities, such as corruption less risky and financially costly, and perhaps also less costly morally in a country where such activities are more common. In addition, extensive personal or ethnic networks may serve as a substitute for formal institutions (cf. Kiong & Kee, 1998; Park & Luo, 2001; Shafer, Fukukawa, & Lee 2007; Tong, 2005). All these arguments converge on a hypothesis that Chinese FDI may be attracted to (specialize in) countries with poor institutions.

The fact that Chinese multinationals are predominantly state-owned whose activities reflect political objectives augments and adds nuance to this hypothesis. Several studies argue that the organization of these companies, the focus on political expediency of investments, and the economic and political backing of the government, have led to excessive risk taking and unprofitable investments (Buckley et al., 2007; Morck et al., 2008; Yeung & Liu, 2008). As one main effect of institutions is to reduce risk (Blonigen, 2005), this again suggests that Chinese investment may be attracted to countries with poor institutions. This leads to the first hypothesis to be tested in our empirical analysis:

Hypothesis 1. Chinese FDI is attracted by countries with poor institutions

The variety of political objectives that Chinese FDI may reflect do, however, also entail the need to make some important distinctions between different types of host country institutions. The previous arguments all suggest that Chinese FDI may flow to countries with weak private sector institutions, i.e. institutions governing the profitability of productive enterprise, such as the rule of law. It has, however, been suggested that that China may direct FDI to undemocratic countries for ideological or strategic reasons (Buckley et al., 2007). This would suggest that a different type of institutions attracts Chinese FDI, namely institutions of public accountability, or democracy.⁷ While state ownership and the institutional setting in China predict a negative relationship between Chinese FDI and the quality of host country institutions, different theoretical premises thus lead to two different sub-hypotheses on which institutions matter. Since existing studies of Chinese FDI have used composite institutional proxies, they do not really address these questions. In our empirical analysis, we use disaggregate institutional indices to test whether private sector institutions or democracy in host countries affect Chinese FDI.

As for natural resources, a number of studies suggest that China invests in resource rich countries to obtain greater security of access to energy and other resources (Cheng & Ma, 2008; Deng, 2004; Hong & Sun, 2006; Morck et al., 2008). Frynas and Paolo (2007) see this as a primary motive for China's involvement in Africa. Energy security is seen as necessary to maintain a high rate of economic development, upon which the future of the government likely depends. In fact, given experiences of unrest in other countries due to shortages or rising prices of energy, this may be viewed as particularly important to maintain control politically. Given the geopolitical importance of oil, controlling energy resources may also be of strategic importance. In principle, it could be that Chinese investment in natural resources could reflect competitive advantages in this sector. Cheng and Ma (2008) present some arguments to this effect, but this is deemed unlikely by Frynas and Paolo (2007). If Chinese investment is directed to natural resource rich countries, this most likely reflects political objectives. To find out whether this is actually the case, we test the following hypothesis:

⁶ This also means that Dunning's eclectic paradigm, which is "the dominant paradigm explaining the extent and pattern of the foreign value added activities", i.e. profit maximizing activities (Dunning, 2000:163), may not be directly applicable to the Chinese case, hence it is not used to structure the discussion here.

⁷ See Kolstad (2009) for a discussion of the distinction between private sector institutions and institutions of public accountability.

Hypothesis 2. Chinese FDI is attracted by countries with large natural resources

Testing this hypothesis also allows us to address the contrary claim of *Globerman and Shapiro (2009)* that securing resources is a relatively unimportant motive for Chinese FDI. As noted earlier, previous studies of Chinese FDI arrive at different results for the importance of natural resources, using different proxies for this variable. We therefore also distinguish between different types of resources, notably fuels and ores and metals.

An empirical specification reflecting the above two hypotheses, would test only for direct or unconditional effects of institutions and natural resources on FDI, respectively. In other words, do poor institutions generally attract Chinese FDI, and do natural resources generally attract Chinese FDI? There is good reason, however, to believe that the effect of these two explanatory variables on FDI may be linked; that the impact of institutions on FDI depends on the level of resources, and vice versa. A number of studies on natural resources and development point out, that certain of these resources present large and appropriable rents. Such rents lead to problems of corruption, rent-seeking and patronage in resource rich countries with poor institutions (*Kolstad & Wiig, 2009a; Leite & Weidmann, 1999; Mehlum, Moene, & Torvik, 2006; Robinson, Torvik, & Verdier, 2006*). A study of oil companies in Angola also argues that while institutions may reduce risk, costs and increase productivity, institutions also have an impact on the distribution of rents, potentially shifting rents from host country governments and multinational corporations to host country populations (*Wiig & Kolstad, 2010*).

Given the large and appropriable rents in natural resource rich countries, it is reasonable to argue that the returns to any competitive advantage China has in operating in countries with poor institutions are greater where these kinds of resources are present. Companies with a competitive advantage in bribery are likely to invest more in countries where the payoffs from bribes are greater, which is arguably the case in resource rich countries. Distributive effects of institutions are more likely to outweigh risk and cost effects in resource rich countries, producing greater gains to those investors able and willing to manoeuvre a challenging institutional setting. These arguments relate to both commercial and political returns, if secure access to natural resources is important politically, this can be achieved more efficiently in countries where Chinese companies have a competitive advantage.

In sum, this means that one would expect institutions to have more of a negative effect on Chinese FDI, the more natural resources a host country has. Or conversely, natural resources attract Chinese FDI more, the worse the institutions of a host country. This can be tested by including an interaction effect between institutions and natural resources, which would be negative if the above arguments hold. Thus, our third hypothesis is:

Hypothesis 3. Chinese FDI is negatively related to the interaction of natural resources and institutions.

Our empirical specification will thus include variables that simultaneously test the effect of institutions and resources, and their interaction. If support is found for hypothesis 3, one way to interpret this is that Chinese investment abroad is made to exploit countries with large natural resources and poor institutions, confer the above discussion on the distribution of resource rents. Other interpretations are also possible, for instance that for China as a latecomer in FDI, the only opportunities for investment in natural resources are in poorly governed countries, and we attempt to empirically distinguish these two interpretations.

4. Data and methodology

Consistent with the theory and hypotheses formulated, our empirical specification includes institutions and natural resources as well as their interaction as explanatory variables. More precisely, the main estimated equation is:

$$\begin{aligned} \text{Chinese outward FDI}_i = & \alpha + \beta_1 \text{Institutions}_i \\ & + \beta_2 \text{Natural resources}_i \\ & + \beta_3 (\text{Institutions}_i \\ & * \text{Natural resources}_i) + \gamma \text{Controls}_i \\ & + \varepsilon_i \end{aligned} \quad (1)$$

Table 3 presents the proxies used for the main variables, and the sources of data. Our dependent variable is Chinese outward FDI flows, for which UNCTAD has data for the years 2003–2006 for 142 host countries. As noted, this data captures Chinese FDI more comprehensively than earlier data used in previous studies such as *Buckley et al. (2007)* and *Cheung and Qian (2008)*, which only captured approved flows. The data for our dependent variable is in millions of constant 2000 USD.

The main institutional variable in our analysis is the Rule of Law index from the World Bank Institute (WBI) Governance Indicators (cf. *Kaufmann et al., 2008*). The WBI indicators have the advantage that they have greater coverage of countries than other indices like those from the PRS group used in previous studies. The Rule of Law index measures “the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence”. The index runs from –2.5 to 2.5, with higher numbers signifying better institutions. This index broadly reflects the preceding theoretical arguments on the role of institutions in attracting Chinese FDI, and this index has also been used as a proxy for private sector institutions in other studies. Rule of law institutions have proved particularly important to avoiding rent-seeking problems in resource rich countries (*Kolstad, 2009; Mehlum et al., 2006*). If Chinese investment is found to be attracted to resource rich countries with weak rule of law institutions, this may be particularly problematic. To check for robustness and the importance of other similar institutional dimensions, we also reran our estimations with other WBI

Table 3
Main variables.

Variable	Explanation	Source
Chinese outward FDI	Annual inflow of Chinese FDI	UNCTAD
GDP	Host country GDP	World Bank World Development Indicators 2008
Trade	Total import and exports as share of GDP	World Bank World Development Indicators 2008
Inflation	Inflation rate	World Bank World Development Indicators 2008
Distance	Distance between capital of host country and China	CEPII, http://www.cepii.fr/ World Bank Institute (WBI)
Institutions	Rule of law	Governance Indicators, from Quality of Government Institute
Natural resources	Fuels, ores and metals exports as share of GDP	World Bank World Development Indicators 2008

Table 4
Correlation matrix for main specification (N = 104).

	Chinese outward FDI	GDP	Trade	Inflation	Distance	Institutions	Natural resources	Institutions * Nat. resources
Chinese outward FDI	1.00							
GDP	0.41	1.00						
Trade	−0.05	−0.20	1.00					
Inflation	−0.01	−0.09	−0.13	1.00				
Distance	−0.23	−0.04	−0.27	0.16	1.00			
Institutions	0.07	0.32	0.28	−0.30	−0.12	1.00		
Natural resources	0.10	−0.13	0.15	−0.03	−0.20	−0.13	1.00	
Institutions * Nat. resources	−0.14	0.04	0.22	−0.21	−0.140	0.58	0.02	1.00

Governance Indicators, and Transparency International's Corruption Perceptions Index (CPI).

Since some theoretical arguments point to private sector institutions, and others to democracy as determinants of Chinese FDI, we also use indices of democracy to test the relative importance of these arguments. The main proxy for democracy used for this purpose is the Polity IV democracy index. However, we also perform similar tests using indices from Freedom House and the WBI voice and accountability index.

As our proxy for natural resources, we use the share of fuels plus ores and metals exports in GDP. By using exports shares of a set of primary products, we followed the seminal study of Sachs and Warner (1995) on the impact of resources on growth, and a number of subsequent studies of the economic consequences of natural resources. The previous studies of Chinese FDI have used different indices of natural resources and got different results. We test for the importance of various resources by also disaggregating our natural resource index into fuels and ores/metals exports, respectively. Some recent work has suggested that instead of export shares, studies of natural resources should use indices of resource endowments, i.e. how much is in the ground (Brunnschweiler & Bulte, 2008; Lederman & Maloney, 2008). However, consistent with the arguments of Kolstad and Wiig (2009b), what would be attractive to investors are natural resource rents rather than what is in the ground, which makes export shares a better proxy than resource endowments.

We interact the institutional and natural resource variable for our main estimation. A concern that naturally arises in including interacted variables, is that they will be highly correlated with the individual variables from which they arise, causing multicollinearity problems. This turns out not to be a problem for our main estimations, however. The interaction term is not too highly correlated with the two individual variables from which it is computed (see correlation matrix in Table 4). We also computed variance inflation factors following our main estimations. The highest of these was 2.07 for the full sample, and 2.65 for the sub-sample of non-OECD countries. These are well below levels conventionally taken to imply multicollinearity. Multicollinearity turns out to be a problem only for the sub-sample of OECD countries (see next section).

We added a number of control variables that have been found to be of importance in previous studies of host country determinants of global FDI flows (see Chakrabarti (2001) or Blonigen (2005) for reviews). The main control variables are GDP, trade, inflation, and geographic distance between the host economy and China. GDP is found to be robustly associated with FDI in a number of studies. It is commonly argued to reflect market size in host economies and hence market-seeking motives of investors. Trade, measured as the sum of imports and exports as a percentage of GDP, is similarly found to be a robust determinant of FDI across a number of studies. Inflation is commonly used as a measure of macroeconomic stability in host countries, though results on this variable are more mixed. Since the costs of investing in more distant location is greater, we also include the geographical distance from the capital of the host country to Beijing, as an explanatory variable, in line

with gravity models of FDI. The expectation is for the coefficients of GDP and trade to be positive and for inflation and distance to be negative. We also tested the robustness of our main results by adding a number of additional control variables, such as exchange rates, interest rates, total FDI, economic growth, GDP per capita, educational levels and infrastructure, all from the World Bank World Development Indicators. We also add regional dummies. A number of the aforementioned variables were used in previous studies of Chinese FDI. In addition, we included a number of variables found significant in these studies. These included cultural proximity to China (common language), a dummy for common border with China, and a dummy for landlocked countries. None of these variables turned out to be significant, and so are not included in the main specification.

Since there is data for our dependent variable only for four years, there is too little variation over time in the variables included in the analysis for panel estimation techniques to add much value. We therefore report OLS estimations (with robust standard errors) using the average of Chinese outward FDI to the host countries for the period 2003–2006 as our dependent variable. We also performed panel data estimations. Pooled OLS gives similar results as OLS of average flows. Fixed effects estimations provide few significant results, which could reflect that there is little action in the temporal dimension in our data set.⁸ Our approach is also consistent with other studies of FDI flows, which smooth FDI flows by using period averages. To address endogeneity or reverse causality problems, we lag the explanatory variables, using their average for the period 2000–2002. We expect, however, that endogeneity problems are unlikely to matter since Chinese FDI is still too minor in most countries to affect institutions. While an identifying assumption of our analysis is the absence of heterogeneity across observational units, including region dummies does not change results suggesting that this may not be too much of a problem. The next section presents the results of our estimations.

5. Results

Table 5 presents the main results from our analysis, where the annual average of Chinese outward FDI flows for the period 2003–2006 are regressed on annual averages of the explanatory variables. The first two columns of the table show estimation results for the full sample of 104 countries for which data is available, while in the last two columns the sample is split into OECD and non-OECD countries.

In the first regression, the interaction effect between institutions and natural resources is not included. The results show that the only variable to be significantly associated with Chinese outward FDI is host country GDP. In other words, Chinese outward FDI is attracted to countries with large markets. None of the other explanatory variables are significant. In particular, this estimation finds no effect of host country natural resources or institutional level on the inflow of Chinese FDI.

⁸ Results available from the authors on request.

Table 5
OLS regression results, dependent variable Chinese outward FDI 2003–2006.

	Regression 1	Regression 2	OECD	Non-OECD
GDP	1.24e–11*** (2.50e–12)	1.15e–11*** (2.68e–12)	1.08e–11* (5.63e–12)	6.96e–11 (4.87e–11)
Trade	–0.007 (0.069)	–0.010 (0.073)	–0.237 (0.308)	0.068 (0.048)
Inflation	0.102 (0.166)	0.087 (0.144)	0.832 (0.824)	0.105 (0.157)
Distance	–0.002 (0.001)	–0.002 (0.001)	–0.008 (0.009)	–0.001* (0.001)
Institutions	–2.046 (3.364)	2.106 (3.560)	42.263 (34.331)	–1.898 (3.364)
Natural Resources	25.841 (20.682)	29.906 (18.911)	3655.282 (2584.299)	33.085** (14.760)
Institutions * Nat. Resources		–46.473** (21.263)	–1960.285 (1386.431)	–42.514** (20.382)
Constant	21.923 (15.976)	21.625 (15.944)	13.258 (71.861)	4.339 (7.724)
Obs	104	104	25	79
R-sq	0.236	0.263	0.388	0.261

White standard errors in parentheses.

* Indicates significance at the 10% level.

** Indicates significance at the 5% level.

*** Indicates significance at the 1% level.

The second regression shows, however, that excluding the interaction between resources and institutions, is too restrictive an empirical model. When adding the interaction between institutions and natural resources, we get a significant and negative coefficient for this term, while results otherwise are qualitatively unchanged. In other words, rejecting the influence of institutions and natural resources on Chinese investments based on the first regression would be premature. In fact, the significance of the interaction effect tells us that the effect of natural resources on Chinese outward FDI depends on the institutions of the host country. Recall that the institutional index runs from –2.5 to 2.5. For countries with bad institutions (index negative) natural resources attract Chinese investment. For countries with good institutions (index positive) Chinese investment is discouraged by natural resources. The worse the institutions are in the host country, the greater Chinese investment is attracted by natural resources. Conversely, the effect of institutions also depends on the natural resources. The more natural resources, the more is Chinese FDI attracted by poor institutions. In sum, Chinese outward FDI is attracted to countries which combine large natural resources and poor institutions.

We also tested whether replacing the rule of law index with other institutional indices with natural resources lead to similar results. Interestingly, results are qualitatively similar for most indices reflecting private sector institutions in some sense, i.e. the WBI governance indices which measure control of corruption, political stability, government effectiveness, and regulatory quality (but not for the Transparency International CPI). However, neither institutions nor their interaction with resources are significant when the Polity IV democracy index is used as the institutional proxy. The same result obtains if we use the Freedom House average index, or the WBI voice and accountability index. In other words, Chinese FDI does not appear to be driven to undemocratic countries, resource rich or not, by ideological motivations.

The results also seem to be related to a particular type of resource. Replacing the broad natural resource index with narrower indices of fuel exports in GDP or ores and metals exports in GDP, our results shows that the interacted term is significant only for fuel exports. This suggests that petroleum is the resource of primary interest for Chinese FDI. The coefficient of the individual fuels term is not significant, however, so again this variable is only significant when interacted with institutions.

A range of robustness tests shows this result to be a resilient one. A significant and negative interaction effect remains even if

additional control variables are added, such as exchange rates, interest rates, total FDI, economic growth, GDP per capita, educational levels, patents, and infrastructure (mobile phones).⁹ Moreover, the result is robust to the inclusion of other institutional variables, such as all other WBI governance variables, the average of Freedom House political rights and civil liberties index and their freedom of press index, and the Polity IV democracy index.¹⁰ We get the same result if we add region dummies, an index of cultural proximity to China, a dummy for common border with China, and a dummy for landlocked countries. None of these other control or institutional variables proved significant. We also tested whether the results are due to a few outliers, notably Sudan and the Russian Federation (cf. Table 1), which proved not to be the case.

The results from the full sample thus suggest two main sets of determinants of Chinese outward foreign direct investment; market size, and natural resources coupled with poor institutions. Splitting the sample into OECD- and non-OECD countries reveals that these sets of determinants are associated with different kinds of host countries. The third column of Table 5 presents results when rerunning the main estimation for OECD countries only, of which there are 25 in our sample. The only significant variable is GDP, which suggests that Chinese FDI into rich countries is driven by market size. The fourth column of the table presents results for non-OECD countries, and shows that GDP is not a significant determinant of Chinese FDI to these countries, but that distance from China deters investment in these countries, which was not a significant variable in the full sample.

More interestingly given our focus, natural resources and institutions appear to be determinants of FDI to non-OECD countries only. The improbably large coefficient of the interaction effect in the OECD sample is due to multicollinearity. *F*-tests reveal that the interaction effect and its constituents are not jointly significant. By contrast, both the individual natural resource term and the interacted term are significant for non-OECD countries. The positive coefficient of resources suggests that Chinese FDI is attracted to countries with natural resources. The negative interaction effect indicates that the degree of that attraction depends on institutions, and that the attraction of resources is

⁹ Attempts to use other proxies for infrastructure resulted in multicollinearity problems.

¹⁰ Addition of Transparency International's Corruption Perceptions Index resulted in multicollinearity problems.

greater the worse the institutional environment. The effect of natural resources on Chinese FDI is also economically significant. For a country whose institutional score is -1.5 (which is about the score of Angola), the total coefficient of natural resources is approximately 97,¹¹ which means that an increase of natural resource exports in GDP of 10 percentage points brings an additional Chinese investment of almost 10 million USD (in constant 2000 dollars).

In sum, we find that Chinese outward FDI is attracted to large markets, and countries with large natural resources and poor institutions. The former is related to advanced markets, whereas the latter is the case for non-OECD countries. Our result for GDP is consistent with that of Buckley et al. (2007), Cheung and Qian (2008) and Cheng and Ma (2008). However, we do not find an unconditional effect of institutions on Chinese FDI as did Buckley et al., nor are natural resource insignificant as in their study. Instead, our results suggest that the effect of institutions is inherently related to natural resources; the weaker the institutions the more is Chinese outward FDI attracted by natural resources. The differences in results from previous studies may reflect the use of newer and more comprehensive data, or that previous studies have a more restrictive empirical model which did not include interaction effects.¹²

Our findings are consistent with the idea that Chinese FDI is conducted to exploit countries with poor institutions and large natural resources. However, as noted earlier, it is also possible that Chinese investment flows to countries with these characteristics, since these represent the only available locations for a latecomer such as China. We tested whether the second interpretation holds, by adding the growth in resource exports as an explanatory variable. If Chinese investment flows to countries that have unexploited resources and hence are still growing in terms of natural resources, this should make the interaction term insignificant. However, the interaction term of institutions and resources remains significant when adding this term. This lends support to the former explanation that China takes advantage of countries with poor institutions and large natural resources.

Our results also lend support to the idea that determinants of Chinese FDI differ from that of other countries. Rerunning our estimations using total FDI inflows as a dependent variable,¹³ there is no significant direct effect of natural resources on FDI, nor is the interaction between natural resources and institutions significant. This also holds for the sub-sample of non-OECD host countries. In contrast to Chinese FDI, total FDI is attracted to countries with good institutions.

6. Concluding remarks

The results of this paper show that institutions and natural resources have an interactive effect on Chinese outward foreign direct investment. The worse the institutional environment of a host country, the more is Chinese FDI attracted by the country's natural resources. These results add significantly to our understanding of Chinese FDI, since previous studies have not included these types of interaction effects, and therefore fail to capture an important relation between resource riches and institutions. Our findings are consistent with an image of China as a "ravenous dragon". The results are also consistent with the idea that Chinese FDI is conducted to exploit countries with poor institutions and large natural resources.

¹¹ Computed as $33 + (-42.5) \times (-1.5) = 96.75$.

¹² Buckley et al. (2007) also use ores and metals exports to proxy natural resources, which our results suggest is not the relevant type of natural resource to include in the analysis.

¹³ Sample includes 102 of the original 104 countries for which we have FDI data, but differences in results are not due to differences in country samples.

An important question is what consequences this type of investment behaviour has for host economies, and developing economies in particular. It is striking that Chinese foreign investment appears to be attracted by the type of institutional dysfunctions which are at the core of the so-called resource curse, whereby poor institutions lead to a detrimental impact of natural resources on economic development (Mehlum et al., 2006). This may be particularly harmful, since Chinese investment would then play straight into key dysfunctions of resource rich developing countries, possibly exacerbating resource-related problems. This further strengthens the tentative conclusion of Frynas and Paolo (2007:251) that "the new investments in the African oil and gas sector may not necessarily be good news for ordinary Africans".

Our results, and comparisons with previous studies, also suggest that Chinese FDI outflows differ from FDI from other regions, in their attraction to poorly governed countries rich in natural resources. These differences in investment patterns likely reflect background characteristics of the Chinese economy. In particular, predominant state-ownership of multinational companies, and the institutional context of China. Though aggregate FDI flows from China and from other regions differ, there might still be similarities at the sector level which the aggregate data mask. For instance, it is possible that oil investment from China and from other countries is driven by the same set of factors. At present, data which disaggregates FDI flows both by sector and location is not available for most countries, including China. It may also be difficult to discern determinants of Chinese outward FDI relevant to certain specific industries using aggregate data. It has been suggested that strategic investment to reduce competitive disadvantage, in particular to gain access to technology, is important to Chinese multinational firms (Deng, 2009; Rui & Yip, 2008). Although we find no evidence that technology in the form of patents matter at the aggregate level, it might play an important role for Chinese firms in technology intensive industries.

6.1. Managerial relevance

In terms of implications for international business and policy makers, it is important to stress that these are still early days in the study of China's increasing investment abroad. Acceptable data on outward FDI is available for a limited number of years, and more studies are needed to ascertain and monitor the evolution of Chinese investment motives in the years to come. Moreover, the highly challenging question of how to account for investment flows through tax havens is important for a more complete understanding of Chinese FDI. If affirmed in future studies, our results indicate that Western multinationals will face an increasingly challenging competitive situation in countries where Chinese companies face a lesser "liability of foreignness" in terms of low institutional standards. At a policy level, our results highlight the need for measures to address negative effects of multinational investment in poorly governed resource rich countries such as Sudan, Nigeria or Angola.

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