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. The focus is in particular on institutional and natural resource-related determinants, and their interaction. 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.

Keywords: FDI, China

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 dispositions more generally have contributed to propping up bad regimes in host countries, and 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?[1]

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. 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, which suggests that these flows may differ from those of developed economies. 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 Buckley et al (2007) is the only study of the determinants of Chinese outward FDI which we are aware of. They find that FDI is attracted to countries with high political risk, but that there is no significant effect of natural resources on Chinese outward FDI.

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 study of Buckley et al (2007) is that their data on FDI captures approved investment for the period 1992-2001, rather than actual investment. 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, even if investment is made to get access to natural resources, it is not obvious that a government would want to reveal this strategy through the pattern of approved flows. This paper uses newer 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 test and finds of significant importance an interacted effect of instutions and resources, suggesting

[1] The Economist, March 15th 2008, Special report p. 3.

that Chinese investment is more attracted to a country with natural resources, the worse the institutional environment of that country.

The paper is structured as follows. Section 2 provides a descriptive overview of Chinese FDI, reviews relevant theory and empirical evidence, and presents the hypotheses to be tested. Section 3 presents the empirical strategy and the data. The results are presented and discussed in section 4. Section 5 concludes.

2 Chinese outward FDI: Patterns, theory and hypotheses

2.1 Descriptive overview of Chinese outward FDI

Foreign direct investment from China has increased considerable in recent years, and China is the source of FDI in a great number of host economies. According to 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.

Table 1. Largest 15 host countries of Chinese outward FDI, 2003-2006, current USD 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

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. Table 2 breaks Chinese FDI into host regions, where the dominant flows are to Latin American and the Caribbean, and to Asia, again reflecting 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.

Table 2 Regional shares of Chinese outward FDI, 2003-2006[2]

	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 Carribean	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

The econometric analyses performed in this paper will provide more systematic evidence on which factors influence Chinese FDI. As data for all relevant variables is not available for the three largest destinations of Chinese FDI, the results generated will be representative for other types of destinations than these three.

2.2 Theories and evidence on Chinese outward FDI

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 theoretical arguments and/or simple descriptive data on Chinese investment. The only study to perform a more rigorous econometric analysis of Chinese FDI is that of Buckley et al (2007). They find that more Chinese investment goes to countries with large GDP, poor institutions (proxied by an index of political risk), high inflation, high exports and imports, and cultural proximity to China. Natural resources, patents, exchange rates, distance from China and total FDI to GDP, were found to be insignificant.

Some of these results are consistent with and some contrary to those reached in the empirical literature on global FDI flows. Of particular interest here is the result that Chinese investment is attracted by poor institutions, which is the opposite to what has been found for FDI generally. Findings such as these have been used to underpin arguments that Chinese investment, and FDI from emerging economies more generally, reflect different motives or conditions than FDI from developed economies, and require different theoretical arguments. Though some theoretical arguments have been advanced on this point, more rigorous analysis is needed in this area. Moreover, the apparent attraction of Chinese investment to countries with poor instutions can result from different theoretical mechanisms, and their relative merit needs to be tested empirically. One possibility is that the association between Chinese FDI and institutions is related to natural resources, which is the focus of the empirical analysis performed below.

2.3 Hypotheses

Using newer and more comprehensive FDI data than previous studies, we test an expanded empirical model on the impact of institutions and natural resources on Chinese outward FDI. Since previous studies have argued and found that Chinese FDI is attracted by a poor institutional environment, we retest the impact of host country institutions on Chinese FDI. Hence, the first hypothesis to be tested is:

Hypothesis 1: *Chinese FDI is attracted by countries with poor institutions*

[2] Country classifications according to United Nations Statistics Division.

Though the study of Buckley et al (2007) did not find an impact of natural resources on Chinese FDI, it is possible that this is due to the use of an poor proxy for resources. They used the share of ores and metals exports in total merchandise exports as their measure of host country natural resources. This is problematic since we would expect that petroleum would be a key resource for China, which is not included in the ores and metals measure. Moreover, in studies of the economic impact of natural resources it is common to use resource exports as a share of GDP or GNI, not merchandise exports. Using a proxy for natural resources that captures these elements, the second hypothesis to be tested is:

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

If Chinese FDI is found to be attracted to countries with poor institutions, it is possible that this average result masks differences between host countries related to their natural resource wealth. In particular, it is conceivable that Chinese companies would be more attracted to countries with poor resources, the greater the potential reward in terms of access to natural resources. Or conversely, natural resources may be more attractive to Chinese investment in countries where governance is poor. In other words, it is possible that there is a significant interaction effect between institutions and resources, where the marginal effect of each variable on Chinese FDI depends on the level of the other variable. Consistent with this argument, we formulate a third hypothesis:

Hypothesis 3: *The effect of natural resources on Chinese FDI is larger the worse the institutions of a country*

Our empirical specification will thus include variables that simultaneously test the three hypotheses, i.e. both individual variables 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. This would be particularly harmful, since Chinese investment would then play straight into key dysfunctions of resource rich countries, whereby poor institutions lead to a detrimental impact of natural resources on economic development, what has been termed the "resource curse".

3 Data and methodology

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

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

Table 3 presents the proxies used for the various 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. This data captures Chinese FDI more comprehensively than earlier data used in previous studies such as Buckley et al (2007), which only captured approved flows. The data for our dependent variable is in millions of constant 2000 USD.

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/
Institutions	Rule of law	World Bank Institute (WBI) Governance Indicators, from Quality of Government Institute
Natural resources	Fuels, ores and metals exports as share of GDP	World Bank World Development Indicators 2008

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 groups 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". These issues can be expected to be of particular importance to foreign investors. In addition, rule of law institutions have proved particularly important to avoid rent-seeking problems in resource rich countries (Mehlum et al, 2006; Kolstad, forthcoming), so if Chinese investment is found to be attracted to resource rich countries with weak rule of law institutions, this may be particularly problematic. However, we have also rerun our estimations with other institutional variables, to check for robustness and dimensions of institutional quality that Chinese investment appears to emphasize. Beyond the other WBI indicators, these include indices from Freedom House, Transparency International, and Polity IV.

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 thus follow the seminal study of Sachs and Warner (1995) on the impact of resources on growth, and a number of other studies of the economic consequences of natural resources. Our proxy differs somewhat from that used by Buckley et al (2007), which is the ratio of ore and metal exports to total merchandise exports. By excluding fuels and hence petroleum, it is possible that their proxy fails to capture resources of importance to Chinese investment. We test this 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 (e.g. how much is in the ground) (Brunnschweiler and Bulte, 2008; Lederman and Maloney, 2008). However, consistent with the arguments of Kolstad and Wiig (2008), 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.

As reflected by the above specification, we interact the institutional and natural resource variable for our main estimation. A concern that naturally arises in included interacted variables, is that they will be highly correlated with the individual variables from which they arise, and hence cause multicollinearity problems. This turns out not to be a problem for our main estimations, however.

We add a number of control variables that have been found to be of importance in previous studies of host country determinants of FDI flows (Chakrabarti, 2001; Blonigen, 2005). The main control variables are GDP, trade, inflation, and distance between the host economy and China. GDP is found to be robustly associated with FDI in a number of studies, and 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 Buckley et al (2007). The expectation is for the coefficients of GDP and trade to be positive and for inflation and distance to be negative. We also test the robustness of our main results by adding a number of additional control variables, such as exchange rates, interest rates, total FDI, economic growth, educational levels and infrastructure, all from the World Bank World Development Indicators, but none of these proved of significance.

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 to reasonably employ panel estimation techniques. We therefore perform OLS estimations using the average of Chinese outward FDI to the host countries for the period 2003-2006 as our dependent variable. This 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. The next section presents the results of our estimations.

4 Results

Table 4 presents the main results from our econometric analysis, where the annual average of Chinese outward FDI flows for the period 2003-2006 are regressed on annual averages of the control 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.

Table 4. OLS regression results, dependent variable Chinese outward FDI 2003-2006

	Regression 1	Regression 2	OECD	Non-OECD
GDP	1.24e-11***	1.15e-11***	1.08e-11*	6.96e-11
	(2.50e-12)	(2.68e-12)	(5.63e-12)	(4.87e-11)
Trade	-0.007	-0.010	-0.237	0.068
	(0.069)	(0.073)	(0.308)	(0.048)
Inflation	0.102	0.087	0.832	0.105
	(0.166)	(0.144)	(0.824)	(0.157)
Distance	-0.002	-0.002	-0.008	-0.001*
	(0.001)	(0.001)	(0.009)	(0.001)
Institutions	-2.046	2.106	42.263	-1.898
	(3.364)	(3.560)	(34.331)	(3.364)
Natural Resources	25.841	29.906	3655.282	33.085**
	(20.682)	(18.911)	(2584.299)	(14.760)
Institutions* Nat. Resources		-46.473**	-1960.285	-42.514**
		(21.263)	(1386.431)	(20.382)
Constant	21.923	21.625	13.258	4.339
	(15.976)	(15.944)	(71.861)	(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 1% level, ** at 5%, * at 10%*

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.

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, what the significance of the interaction effect tells us is 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. And the worse institutions in the host country, the more is Chinese investment attracted by natural resources. Conversely, the effect of institutions also depends on the natural resources. For given resources, a worse institutional environment attracts more Chinese FDI. In sum, Chinese outward FDI is attracted to countries with large natural resources and poor 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, educational levels and infrastructure (mobile phones).[3] Moreover, the result is robust to the inclusion of

[3] Attempts to use other proxies for infrastructure resulted in multicollinearity problems.

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.[4] None of these other control or institutional variables proved significant. We also tested whether the interaction of these other institutional variables with natural resources leads to similar results. Interestingly, the results hold for indices reflecting institutional effectiveness in some sense, i.e. WBI governance indices of control of corruption, political stability, government effectiveness, and regulatory quality. However, natural resources were insignificant when interacted with indices reflecting democracy, i.e. WBI voice and accountability, the Freedom House average or the Polity IV democracy index. Replacing the broad natural resource index with narrower indices of fuel exports in GDP or ores and metals exports in GDP, shows that the interacted term is significant only for fuel exports, which suggests that petroleum is the resource of influence for Chinese FDI.

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 4 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 mainly.[5] In fact, 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 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, 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). However, we do not find an unconditional effect of institutions on Chinese FDI as they did, nor are natural resource insignificant as in their study. Instead, our results suggest that the effect of

[4] Addition of Transparency International's Corruption Perceptions Index resulted in multicollinearity problems.
[5] Due to multicollinearity problems, it is hard to completely rule out that institutions and resources matter in OECD countries.

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 better data, or that previous studies have a more restrictive empirical model which did not include interaction effects.[6]

Our results do lend some support to the idea that determinants of Chinese FDI differ from those of other countries. Rerunning our estimations using total FDI inflows as a dependent variable,[7] 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. Moreover, the coefficient of GDP is larger for total FDI, suggesting that this is a weightier determinant of total FDI than Chinese FDI.

5 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 failed to capture an important relation between resource riches and institutions. Our findings are consistent with the idea that Chinese FDI is conducted to exploit countries with poor institutions and large natural resources. However, the results may also be consistent with other interpretations, and more work is needed on the motives and conditions that would result in the empirical results demonstrated here.

Though these results should be confirmed through further analysis, the findings have policy implications on an international level and for regional organisations such as SADC. If Chinese investment is part of resource curse problems of countries with large resources, this needs to be addressed as part of a drive to mitigate the resource curse. In countries with poor institutions, a problem is that those in power benefit from dysfunctional arrangements related to natural resource rents. Given their vested interests, it is unlikely that governments of resource rich countries themselves will address potentially detrimental practices of multinational companies. Action of a higher, regional or international level, is therefore needed to discipline companies that act in an untoward manner. These include means to make unethical practices more costly, for instance by excluding corporations whose conduct is questionable, from market opportunities in other countries.

[6] 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.
[7] Sample includes 102 of the original 104 countries for which we have FDI data.

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