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The Effects of International Politics on Oil-Exporting Developing Countries

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March 2014

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International politics affects oil trade. But does it affect the oil-exporting developing countries more? We construct a firm-level dataset for all U.S. oil-importing companies over 1986-2008 to examine how these firms respond to changes in "political distance" between the U.S. and her trading partners, measured by divergence in their UN General Assembly voting patterns. Consistent with previous macro evidence, we first show that individual firms diversify their oil imports politically, even after controlling for unobserved firm heterogeneity. We conjecture that the political pattern of oil imports from these individual firms is driven by hold-up risks, because oil trade is often associated with backward vertical FDI. To the extent that developing countries have higher hold-up risks because of their weaker institutions, the political effect on oil trade should be more significant in the developing world. We find that oil import decisions are indeed more elastic when firms import from developing countries, although the reverse is true in the short run. Our results suggest that international politics can affect oil revenue and hence long-term development in the developing world.

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The Effects of International Politics on Oil-Exporting Developing Countries[*]

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Abstract

International politics affects oil trade. But does it affect the oil-exporting developing countries more? We construct a firm-level dataset for all U.S. oil-importing companies over 1986-2008 to examine how these firms respond to changes in "political distance" between the U.S. and her trading partners, measured by divergence in their UN General Assembly voting patterns. Consistent with previous macro evidence, we first show that individual firms diversify their oil imports politically, even after controlling for unobserved firm heterogeneity. We conjecture that the political pattern of oil imports from these individual firms is driven by hold-up risks, because oil trade is often associated with backward vertical FDI. To the extent that developing countries have higher hold-up risks because of their weaker institutions, the political effect on oil trade should be more significant in the developing world. We find that oil import decisions are indeed more elastic when firms import from developing countries, although the reverse is true in the short run. Our results suggest that international politics can affect oil revenue and hence long-term development in the developing world.

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1. Introduction

Oil investment by multinational companies is one of the oldest forms of foreign direct investment (FDI) in the developing world. When there is more trade internationally in crude oil than any other goods in modern times, oil exports from developing countries are of particular interests. Partly because of their heavy dependence on a single commodity export, national saving in these developing countries appears to be strongly linked to the foreign demand for oil. Moreover, when the oil sector of many of the developing countries are monopolized by their government, oil revenue becomes a major source of government revenue, and hence fluctuation in oil exports has direct impacts on government investment as well as welfare spending in these countries.

In this paper, we consider a particular source of uncertainty that affects oil exports from the developing world, namely the risk of international politics. Since Churchill's days, the key to "energy security" in the industrial world has been thought to be oil diversification, and this belief has provided justification for many advanced economies to develop overseas oil-development policy to ensure equity oil that can be imported readily.[3] Recent empirical work on the pattern of import diversification has confirmed that international politics has a distinctive impact on oil trade. In particular, macro evidence shows that unlike many other traded goods, major-power countries with oil investment overseas diversify their oil imports significantly away from their political enemies (Mityakov, Tang, and Tsui, 2013). In a companion paper, we find that even when import decision is highly decentralized, American firms also diversify their oil imports politically (Kashcheeva and Tsui, 2014). However, little is known about whether

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[3] The idea of energy security can be traced back to the time when Winston Churchill changed coal to oil as a power source for the Royal Navy prior to the First World War. According to Churchill, "Safety and certainty in oil lie in variety and variety alone" (55 Parl. Deb., H.C. [5th ser.] [1913] 1465 [U.K.]).

this political effect on oil trade is larger or smaller when the exporting countries are developing ones.

There are several reasons to expect why the trade effect of international politics are different when the oil-exporting countries are developing ones. For instance, Mityakov, Tang, and Tsui (2013) show that the political effect on oil trade is concentrated among the subsample of nondemocratic countries with higher expropriation risk. Mityakov, Tang, and Tsui conjectured that oil imports are affected by political risk because oil trade is often associated with backward vertical FDI, which is subject to selective discrimination risks, such as tax renegotiation and expropriation. Oil production involves massive upfront investments in exploration, and geological knowledge is country- or even oilfield-specific. In the presence of sizeable appropriable quasi rent (Klein, Crawford, and Alchian, 1978), it is common for bilateral oil trade to be subject to state influence with relationship-specific investment in exploration, pipelines, and refining capacity.[4] Under this *hold-up risk hypothesis*, the political effects should be larger for exporting countries with higher expropriation risk, and only firms with oil investment overseas is expected to respond to international politics. To the extent that developing countries tend to be nondemocratic and associated with higher expropriation risk, one may expect changes in international politics has a larger effect on oil exports from these developing countries.

However, a more careful examination of import decision of individual firms reveal that large oil-importing firms with investment overseas are less responsive to changes in international politics in the short run, perhaps because these firms are likely

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[4] A related reason why oil is only partially fungible is that oil has to be refined, and refineries are built to handle specific types of oil. For example, according to the EIA, "Venezuela's crude oil is heavy and sour by international standards, and hence a significant fraction of the Venezuela's oil production must go to specialized domestic and international refineries" (http://www.eia.doe.gov/cabs/venezuela/oil.html).

to committed to term contracts (Kashcheeva and Tsui, 2014). If these vertically-integrated firms tend to have investment in developing but oil-rich countries, oil exports from these developing countries can be less sensitive to changes in international politics at least in the short run.

The paper proceeds as follows. Section 2 describes the data. Section 3 presents our initial evidence on the effects of international politics on oil imports from American firms. Our main results focusing on oil exports from developing countries are presented in Section 4. Section 5 concludes.

2. The Data and Descriptive Statistics

We combine data from the following sources for our analysis. First, our firm-level crude oil imports data are taken from the U.S. Energy Information Administration (EIA). The EIA dataset provides monthly oil imports data by transaction since 1986. We use this dataset to construct annual oil imports figure by firm.

Data on political distance between country pairs are obtained from Dreher and Sturm (2012), which provides indices of political distance based on voting positions of country pairs in the United Nations General Assembly from 1970-2008. In particular, our measure of political distance, which lies between 0 and 1, is calculated as d/d_{max}, where d is the sum of metric distances between votes by a country-pair in a given year and d_{max} is the largest possible metric distance for those votes.[5] For instance, when two countries always cast the same vote for any proposal, their political distance is zero. Alesina and Dollar (2000) argue that UN votes are a reliable indication of the political alliances between countries, because the pattern of UN votes is strongly correlated with

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[5] Votes are coded as either 1 ("yes" or approval for an issue), 2 (abstain), or 3 ("no" or disapproval for an issue).

alliances and similarity of economic and geopolitical interest. Unlike other indices based on alliance portfolios, UN voting-based indices provide significant time-series variation in political distance. Following Dreher and Sturm (2012) and the majority of the literature, we focus on all votes (i.e., including both key and non-key votes).

Data on standard gravity controls are taken from various sources. GDP and population data are taken from the Penn World Table. Our oil reserves data are obtained from EIA and BP Statistical Review of World Energy. Finally, data on expropriation risk in the oil industry are taken from Guriev, Kolotilin, and Sonin (2011), which provides a list of oil nationalizations, including formal nationalization, intervention, forced sale, and contract renegotiation.

In the full sample, we have 149,801 observations from 60 exporting countries. The descriptive statistics for the variables we use in our analysis are summarized in Table 1.

3. Political Limits on Oil Imports

In our analysis we employ the standard workhorse model in international trade: the gravity equation, which links trade flows between countries to distance between them and their (economic and/or demographic) sizes. Distance in this model is understood quite generally. It includes not only geographical distance but also could account for other factors that reduce trade. In our paper we focus on political relations as impediment to trade.

In its multiplicative constant-elasticity form, the gravity equation for trade states that oil import of firm i from country j to the United States at year t, denoted by M_{ijt} is inversely proportional to their distance D_{ijt} (which typically includes all factors that might create trade resistance), and proportional to the product of the two

countries' GDPs, denoted by Y_{it} and Y_t^{US}:

$$(1) \quad M_{it} = e^{\alpha} \times (D_{it})^{\beta} \times (Y_{it})^{\gamma} \times (Y_t^{US})^{\delta} \times e^{\eta_{it}} \quad ,$$

where α, β, γ, and δ are unknown parameters, and η_{it} is an error term. Provided M_{it} is strictly positive, we can log-linearizing the above equation to obtain the standard representation of gravity equation: $\ln M_{it} = \alpha + \beta \ln D_{it} + \gamma \ln Y_{it} + \delta \ln Y_t^{US} + \eta_{it}$. Our point of departure from the traditional gravity model is our focus on international politics, and hence D_{it} measures the one-year lag of political distance between the United States and country i at year t. The coefficient of interest is β, the estimated impact of US foreign relations on the log of oil imports to the United States. Because crude oil export depends on oil endowment, we also control for oil reserves. In our first specification, we control for country fixed effects and country i's population. In our second specification, we also control for year fixed effects. Adding year fixed effects captures all time-specific characteristic (e.g., global oil price, as well as US GDP, oil reserves, etc.). In our full specification, we also control for firm fixed effects.

One consequence of the log-linearization is that zero trade observations are dropped from the sample. Because our focus is on oil imports of firms and the distribution of oil endowment is highly uneven across countries, the number of observations dropped is indeed quite large. Following Santos Silva and Tenreyro (2006), we estimate the multiplicative form (1) using the Poisson pseudo-maximum-likelihood (PPML) estimator. The main advantages of the PPML estimator are that while it provides a natural way to deal with zero values of the dependent variable, it is also consistent in the presence of heteroskedasticity.

Columns 1 to 3 of Table 2 present the results using the full sample. The first row

reports the estimates of the political distance coefficient, our variable of interest. In all the three specifications, there is a negative and statistically significant association between our measure of political distance and oil imports. In our full specification, for example, a point estimate of -1.176 implies that a one standard deviation increase in political distance (0.122) is associated with a reduction in oil imports by 13 percent.[6]

4. Political Limits on Oil Imports from Developing Countries

To examine the heterogeneity in responses according to the characteristics of the oil-exporting countries, we first divide the sample into countries with and without experience of expropriation over the sample period. Columns 1 to 3 of Table 3 replicate the estimates using the full sample. The rest of the table shows that, consistent with the hold-up risk hypothesis, the political effect on oil imports is indeed driven by countries with higher expropriation risk, measured by experience of expropriation.

We next divide the sample into countries according to their stage of development. Our main results are summarized in Table 4. The estimates using the subsample of the lowest-income countries are reported in column 1. The next two columns report the estimates using the subsamples of middle- to highest-income countries, according to the World Bank definition. Interestingly, the short-run responses are significant in both the lowest and the highest income group, but not in the middle-income group. However, when we examine the dynamic responses by allowing for longer lags, column 4 to column 6 show that among the highest-income countries the political effect on oil trade are most significant in the short run, whereas among the lower-income countries (especially the middle-income group) the political effect on oil trade are more significant

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[6] Implied responses to changes in political distance are computed as: $\exp(\Delta x*\beta)-1$, where Δx is change in distance measure in question and β is estimated coefficient.

only after a few-year lag. In other words, international politics is relevant to oil-exporting developing countries, especially in the long run.

5. Interpretations and Policy Implications

Why international politics appears to affect oil-exporting developing countries more in the long run? First, we should notice that oil expropriation happened in countries with different stages of development in our sample. For example, due to the wave of nationalization in the oil sector during the 1970s, high-income countries today such as Kuwait and Saudi Arabia are classified as countries with expropriation experience in our sample. Two countries, namely Russia and Venezuela, who expropriate the oil sector after the turn of the century are classified as middle-income countries. Bolivia is a low-income country that expropriate recently. To the extent that developing countries are more likely to expropriate in the modern times, the finding that international politics appears to affect them more in the long run is consist with the hold-up risk hypothesis that firms reduce their oil imports from these countries with higher political risk in the long run.

Our findings, therefore, suggest that focusing on short-run response in oil exports from developing countries may understate the importance of international politics in shaping oil trade. While these countries may gain financially in the short run, in the longer run these developing countries will suffer from more volatile exports and hence government revenue due to changes in international politics. To the extent that national saving and investment co-move with oil revenue in these countries, international politics can also affect long-term development in the developing world.

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Table 1: Descriptive statistics

Variable	Mean	Standard Deviation	Min	Max
Sample : 149801 observations, 1986-2008				
Oil Imports	350.048	4061.913	0	197479
Political distance (UNGA voting)	0.757	0.122	0.272	0.956
Log exporter's oil reserves	1.191	2.577	-5.006	5.587
Log exporter's GDP	8.495	1.180	5.117	11.646
Log exporter's population	9.599	1.707	5.328	14.091

Table 2: Political Distance and Oil Imports

	(1)	(2)	(3)
Political distance	-1.298***	-1.180***	-1.176***
	(0.284)	(0.454)	(0.453)
Oil reserves	0.027	0.035	0.034
	(0.026)	(0.031)	(0.031)
GDP	0.466***	0.456*	0.459*
	(0.166)	(0.255)	(0.256)
Population	0.545	-0.187	-0.188
	(0.461)	(0.799)	(0.799)
Country FE	Yes	Yes	Yes
Year FE	No	Yes	Yes
Firm FE	No	No	Yes
Obs (# of countries)	148254(60)	148254(60)	148254(60)

Note: Country-level cluster robust standard errors are in parentheses. All regressions are estimated using PPML method. Political distance is measured with a 1-year lag. Other control variables are measured in log.

Table 3: Political Distance and Oil Imports: Response Heterogeneity by Exporter's Expropriation Risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Political distance	-1.298***	-1.180***	-1.176***	-1.165***	-1.367***	-1.365***	-1.691*	0.132	0.140
	(0.284)	(0.454)	(0.453)	(0.274)	(0.413)	(0.412)	(0.980)	(3.028)	(3.030)
Oil reserves	0.027	0.035	0.034	0.043	0.044	0.044	0.029	0.014	0.014
	(0.026)	(0.031)	(0.031)	(0.028)	(0.040)	(0.040)	(0.063)	(0.080)	(0.080)
GDP	0.466***	0.456*	0.459*	0.419**	0.354	0.356	0.551	0.747	0.748
	(0.166)	(0.255)	(0.256)	(0.189)	(0.333)	(0.332)	(0.414)	(0.554)	(0.555)
Population	0.545	-0.187	-0.188	0.553	-0.296	-0.297	0.845	2.054	2.064
	(0.461)	(0.799)	(0.799)	(0.475)	(0.976)	(0.976)	(1.318)	(1.499)	(1.501)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Firm FE	No	No	Yes	No	No	Yes	No	No	Yes
Obs (# of countries)	148254 (60)	148254 (60)	148254 (60)	73646 (28)	73646 (28)	73646 (28)	74608 (32)	74608 (32)	74608 (32)

Note: Country-level cluster robust standard errors are in parentheses. All regressions are estimated using PPML method. Political distance is measured with a 1-year lag. Other control variables are measured in log. In columns (1)-3), the regressions are estimated based on the full sample. In columns (4-(6) only imports from the countries with the history of expropriations are included in the subsample, and in columns (7)-(9) the subsample includes the rest of the countries. The results of the regression presented in Column (9) should be interpreted with caution because the estimates for the firm fixed effects were not properly estimated.

Table 4: Political Distance and Oil Imports: Response Heterogeneity by Exporters' Stage of Development

	(1)	(2)	(3)	(4)	(5)	(6)
Political distance$_{t-1}$	-2.939**	-1.723	-3.00**	-0.697	-1.384	-1.780**
	(1.188)	(2.562)	(1.320)	(0.503)	(0.970)	(0.721)
Political distance$_{t-2}$	-	-	-	-0.562	-0.677	-1.396**
	-	-	-	(0.618)	(1.395)	(0.674)
Political distance$_{t-3}$	-	-	-	-0.681	-1.430*	0.657
	-	-	-	(0.972)	(0.797)	(0.780)
Political distance$_{t-4}$	-	-	-	-1.213	-0.551	-0.230
	-	-	-	(0.965)	(1.525)	(0.547)
Political distance$_t$	-	-	-	-1.958***	0.591	-1.794*
	-	-	-	(0.741)	(1.807)	(0.967)
Log exporter's oil reserves	0.250*	0.035	0.007	0.060	0.034	0.013
	(0.141)	(0.044)	(0.037)	(0.108)	(0.039)	(0.026)
Log exporter's GDP	0.792	0.941**	0.289	1.114	1.151***	0.386
	(0.493)	(0.457)	(0.301)	(0.532)	(0.408)	(0.386)
Log exporter's population	4.175*	-6.115**	0.314	4.048	-6.928**	0.299
	(2.344)	(2.864)	(0.578)	(2.478)	(3.198)	(0.801)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs (# of countries)	44624(19)	53901(22)	36047(14)	39269(19)	45097(21)	31407(14)

Note: Country-level cluster robust standard errors are in parentheses. The regressions in columns (1) and (4) are estimated based on the subsample of countries that were classified as low-income and lower-middle-income according to the 1999's World Bank definition, the regressions in columns (2) and (5) are estimated based on the subsample of countries that were classified as upper-middle income, the regressions in columns (3) and (6) are estimated based on the subsample of countries that were classified as high income. The list of low-income and lower-middle-income countries are: Angola, Azerbaijan, Benin, Bolivia, China, Cote d`Ivoire, Cameroon, Congo, Dem. Rep., Congo, Republic of, Georgia, Indonesia, India, Kyrgyzstan, Mauritania, Philippines, Papua New Guinea, Chad, Vietnam, and Yemen. The list of upper-middle-income countries are: Argentina, Belarus, Belize, Brazil, Chile, Colombia, Algeria, Ecuador, Egypt, Equatorial Guinea, Guatemala, Iran, Kazakhstan, Malaysia, Peru, Russia, Syria, Thailand, Tunisia, Venezuela, and South Africa. The list of high-income countries are: Australia, Brunei, Denmark, Spain, Gabon, Kuwait, Mexico, Netherlands, Norway, New Zealand, Oman, Saudi Arabia, Singapore, and Trinidad & Tobago.