

Political Limits on World Oil Trade*

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Abstract

The “energy security” doctrine argues that oil dependence on hostile governments imposes a national security threat and other externalities, while many economists believe the world oil market is an integrated one. Using voting records for the United Nations General Assembly to measure the state of international relations, we examine the effect of international politics on the incentives to diversify oil imports. We find that United States imports significantly less oil from her political opponents, even after controlling for wars, sanctions, and tariffs. These political limits are more pronounced when we exploit irregular leadership transitions, using instrumental variables method. A similar import pattern is observed for other major powers with oil companies operating overseas. Our interpretation of these findings is that when oil companies import through term contracts associated with asset-specific foreign investment, they internalize the *country-pair specific* risk of contract renegotiation, especially when the exporters are monopolies controlled by dictators.

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1. Introduction

The cost of oil dependence occupies a central place in energy policy analysis and debate in many oil-importing countries. Concerns about “energy security”¹ has motivated policy researchers to quantify the “externalities,” ranging from economic losses due to disruptions in oil supply to military spending in vulnerable supply areas, as an oil security premium (Leiby, 2007). In particular, the security premium is said to be greater when increased oil imports boost the import share from unstable and hostile regime countries. Accordingly, the oil security externalities call for policy actions, especially in the United States where oil import decisions are decentralized among private oil companies.

In this paper, we ask the following questions: (1) Do political tensions between states reduce trade, especially trade in crude oil, which is widely thought to be a strategic commodity? (2) To the extent that “political distance” (i.e. misalignment in political interests) is an impediment to oil trade, how does the effect compare with the limits imposed by other trade barriers? (3) Do countries where oil import decisions are decentralized diversify less their imports away from their political opponents, because private firms ignore any social costs related to national security?

Understanding the political determinants of oil trade is important, especially in a time of concern about sustainable development. There is more trade internationally in crude oil than in any other goods, and energy security is back on the international political agenda. Unlike some policymakers, many economists maintain that the world oil market is “one great pool,” because crude oil is fungible in an integrated oil exchange market that facilitates trade among strangers (Adelman, 1984). If oil is completely fungible, oil moves to the nearest market first to minimize transportation cost, and cost minimization prevents the market from distinguishing sources from friendly and hostile regimes. On the other hand, in the integrated-market view, unfriendly regimes need to sell oil into the world oil market as much as friendly regimes do, and hence it is global (instead of the composition of) supply and demand that determines economic welfare.

In practice, however, oil may be only partially fungible, especially in the short run, the relevant timeframe for energy security decisions. The oil sector in many oil-rich countries is controlled by the state-owned monopolies. Oil production involves massive upfront investments in exploration, and geological knowledge is country- or even oilfield-specific. In the presence of

¹ The idea of energy security can be traced back to the time when Winston Churchill changed coal to oil as 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.”

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, refining capacity,² and pipelines. International contracts are largely self-enforcing (Thomas and Worrall, 1994), and it is well documented that extractive industries are the most vulnerable to government theft (e.g. Jensen and Johnston, 2011).³ When one party of an international oil agreement becomes a hostile dictator, the other party will take into consideration the increased risk of selective discrimination, including indirect expropriation (e.g. royalty and tax renegotiation) and forced divestment, in her investment and trade decisions.⁴

Using voting records for the United Nations General Assembly to measure the degree of misalignment in political interests (and hence a measure of political distance), we test the hypothesis that major powers diversify their sources of crude oil imports away from their political opponents. In particular, we estimate a modified gravity model in a panel data framework over almost four decades (1962-2000). Our political distance data confirm the famous quote that “a week is a long time in politics.” The substantial time-variation in political distance within country-pair allows us to exploit the panel structure of our data to control for country-pair specific historical factors that affect both political distance and oil trade. Our oil data reveal that only a fraction of countries are oil exporters, because the distribution of oil endowment is highly skewed. Moreover, an oil-importing country can impose sanctions on an exporter when the political tension between the two countries is intensified. In our main specification, therefore, we use the Poisson pseudo-maximum-likelihood (PPML) estimator proposed by Santos Silva and Tenreyro (2006) to deal with zero values of the dependent variable in the context of gravity model of trade.⁵ To correct for potential reverse causality from trade flows to international politics, as a robustness check, we also

² 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>).

³ In an earlier study, Kobrin (1984) documents that mining and petroleum expropriations accounted for 32 percent of all nationalizations over the period 1960-1979 period.

⁴ Another reason why oil may not be completely fungible is that while oil is sold under a variety of contract arrangements as well as in spot transactions, term contracts cover most oil transactions (Slade, Kolstad, and Weiner, 1993). Unfortunately, existing evidence on the integrated-market view is based on movement of prices of different crudes traded in the spot market (e.g. Nordhaus, 2010). Although these spot and contract markets sell the same physical commodity, because of the many stipulations on the magnitude, price, and quality of the product delivered under long-term contractual arrangements, no arbitrage relation necessarily hold between spot and contract market magnitudes similar to those which hold between futures and spot market magnitudes. Wolak (1996) finds that in the case of the US steam coal market, there is a fairly large price premium on contract versus spot transactions.

⁵ A caveat of any estimation technique that incorporates zeros, however, is that it may generate biased estimates if some trade flows are incorrectly reported as zeros. As such, we report both least square and PPML estimates.

exploit irregular transitions in political leadership (not driven by foreign intervention) in oil exporting countries that lead to changes in political distance, using instrumental variables method.

Controlling for exporters' oil endowment and potential supply disruption due to civil conflict, standard gravity controls, as well as exporting country and year fixed effects, we find that the United States imports significantly less crude oil from her political opponents. In our baseline specification that controls for exporter fixed effects, we find that a one standard deviation increase in political distance (approximately the increase in political distance between the United States and Venezuela during the Chávez administration) is associated with a decline in US oil imports by approximately 70 percent. Moreover, US oil companies respond to international politics even after accounting for government policies, including sanctions and import tariffs. Furthermore, the results are also robust to controlling for militarized interstate disputes, suggesting that political limits on oil trade exist even during peacetime. Interestingly, we also find that these political limits are more pronounced when the exporting countries are nondemocratic. However, such political limits are either weaker or nonexistent for other trade aggregates, and the effect is also absent among other oil importing countries which are not major powers. A similar oil import pattern is observed when we use the combined sample of the top oil-importing countries, so that we can account for multilateral trade resistance by including both importer-year and exporter-year fixed effects.

When oil companies do not minimize their transportation cost of oil imports, we have identified a political cost of oil dependence. Our interpretation is that, given the oil industry is highly vertically integrated, the political cost arises because of the potential holdup problem in the upstream sector, and enforcement of international contract is less costly when countries involved are political allies. Whether the energy security problem is actually a problem of externalities in general is somewhat questionable. For instance, the recessionary consequences of oil-price shock can be a result of policy failure, instead of market failure (Barsky and Kilian, 2002). In any case, to the extent that there is an externality created by supply disruptions from unstable governments that are hostile to the importing countries, our findings suggest that international oil companies indeed have incentives to internalize it.

There is a growing body of empirical literature that examines the effects of international politics on trade. Blomberg and Hess (2006) show that political violence (e.g. interstate war) has a negative effect on trade. More importantly, the authors conclude that world peace is perhaps a more important trade-creating factor than bilateral trade pact. Using a rich historical dataset, Glick and

Talor (2010) show that, although wars are rare events, the war impacts on international trade (as well as national income and global economic welfare) are large and persistent. We show that conflict in political interests is a significant impediment to crude oil trade even during peacetime.⁶

More recently, Berger et al. (2010) show that following a CIA intervention during the Cold War period, the foreign government was influenced to directly purchase US imports rather than imports from other countries. Using disaggregated trade data, Michaels and Zhi (2010) find that the deterioration of relations between the United States and France from 2002-2003 significantly reduced bilateral trade, because private firms do not always choose the cheapest suitable inputs. Although crude oil has consistently dominated US imports as well as world trade flows, it has been overlooked by the existing literature. In the case of coal, Wolak and Kolstak (1991) observe that over 1983-1987 Japan imported a significant amount of coal from the United States even though the price of US coal was above that of all other suppliers, whereas the Soviet Union consistently had the smallest market share despite its coal was the cheapest.⁷ Wolak and Kolstak consider a pure economic reason of price-risk diversification to explain Japan's coal import strategy, although the trade pattern is also consistent with the close Japan-US security ties during the Cold War. Finally, Nunn (2007) shows that countries with good contract environment specialize and export goods for which relationship-specific investments are important. We argue that relationship-specificity is also relevant for international politics and oil trade even oil is traded on an organized market, because it is not uncommon for bilateral oil trade to be associated with relationship-specific foreign investment, which is subject to the risk of selective contract renegotiation or even expropriation.

The paper proceeds as follows. Section 2 describes the data and illustrates several stylized examples. Our baseline specification and results using US oil imports data are presented in Section 3. Section 4 addresses the possibilities of heterogeneous effects and simultaneity bias. Section 5 examines other trade aggregates importing into the United States, as well as oil imports into other countries. Section 6 discusses the possible mechanisms of the oil trade pattern and concludes.

2. The Data and Some Stylized Examples

⁶ In addition, Summary (1989), an early contribution, identifies several political factors, such as arms transfers and the number of foreign agents registered in the United States, which affect bilateral trade flows between the United States and other countries. On the other hand, Acemoglu and Yared (2010) find that two countries jointly experiencing greater increases in militarism has lower growth in bilateral trade.

⁷ Japan also consistently imported significantly more coal from Australia than from South Africa, even their prices were similar.

We combine data from the following sources for our analysis. First, our disaggregated bilateral trade data are taken from the NBER-UN world trade data, compiled by Feenstra et. al. (2005). The NBER-UN dataset provides bilateral trade data by commodity (4-digit SITC code) over the 1962-2000 period. In particular, our main dependent variable is the value of crude oil imports, which is classified as “petroleum oils and oils obtained from bituminous minerals, crude” (SITC code = 3330). We also employ this dataset to construct other trade aggregates, according to Leamer (1984) and Rauch (1999).

Data on political distance between country pairs are obtained from the Affinity of Nations Index (Gartzke, 2010). The Affinity of Nations index provides a metric that reflects the similarity of state preferences based on voting positions of country pairs in the United Nations General Assembly since 1946. 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.⁸ 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 alliances and similarity of economic and geopolitical interest.⁹ Unlike indices based on alliance portfolios, UN voting-based indices provides significant time-series variation in political distance. Case studies suggest that this index provides a good proxy for relations between countries.

Figure 1 depicts the time-series of the political distance between the United States and Libya and the fraction of US oil imports from Libya. Although, according to the Correlates of War Formal Alliance dataset (Gibler and Sarkees, 2004), there has never been formal alliance between the US and Libya, a sharp increase in political distance is observed in the late 1970s, when the US government designated Libya a “state sponsor of terrorism.” Indeed, the US government had imposed trade sanctions against Libya over the 1979-2004 period. Not surprisingly, US dependence on Libyan oil co-move negatively with political distance. Figure 2 shows a similar pattern in the case of the US-Iran relations: US dependence on Iranian oil has declined dramatically since the late 1970s, when Ruhollah Khomeini led the Iranian Revolution. In both cases, the decline in oil imports

⁸ Votes are coded as either 1 (“yes” or approval for an issue), 2 (abstain), or 3 (“no” or disapproval for an issue).

⁹ See also Barro and Lee (2005). More recently, Dreher and Jensen (2007) show that the number of conditions on an IMF loan depends on a borrowing country’s voting pattern in the UN General Assembly.

is enforced by trade sanctions. Unlike the case of Libya, however, Iran had been a formal alliance with the United States before 1979.

The examples of Libya and Iran illustrate that sharp variations in international relations driven by political events are associated with adjustments on the extensive margin of oil trade through trade sanctions. Figure 3 shows that, even in the absence of sanction against Venezuela, misalignment in political interests appears to influence the intensive margin of US oil imports. Indeed, more recent data indicate that US dependence on Venezuelan oil has been declining as their political distance was increasing during the past decade under the presidency of Hugo Chávez (not shown in the figure).

To test whether political distance affects oil trade predominantly at the extensive margin because of trade sanctions, we obtain sanctions data from Hufbauer et al. (2007). Data on other standard gravity controls are taken from various sources. The CEPII provides data on bilateral distance, colonial historical links, GATT/WTO membership, and regional trade agreement. Linguistic dissimilarity and religious distance data are provided by Hanson and Xiang (2011), whereas genetic distance data are taken from Spolaore and Wacziarg (2009). GDP and population data are taken from the Penn World Table (version 6.3).¹⁰ Our oil reserves data for are obtained from Dr. Colin Campbell at the Association for the Study of Peak Oil (ASPO), a non-profit organization that is devoted to gathering industrial data to study the dates and impact of the peak and decline of world oil. The ASPO dataset covers most oil countries. We obtain additional information on oil reserves for other countries from three public databases: BP Statistical Review of World Energy (BP), Oil and Gas Journal (OGJ), and CIA factbook (see Cotet and Tsui, 2010).

Political scientists believe that joint democracy increases bilateral trade (e.g. Morro, Siverson, and Tabares, 1998) and that joint democracy makes peace (e.g. Oneal and Russett, 2001). Democracy data are taken from the Polity IV dataset. Civil conflict and interstate violence and warfare may also disrupt trade. The Correlates of War Project provides data on civil war and militarized interstate disputes.¹¹ In some specifications, we also control for tariff duties on US oil

¹⁰ Data for USSR and other former communist countries are obtained from version 5.6.

¹¹ The raw data of the militarized disputes variable can take 5 values, depended on the hostility level of dispute: 1 = no militarized action, 2 = threat to use force, 3 = display of force, 4 = use of force, and 5 = war. Since the potential impact of hostility level on oil imports is not necessarily linear, in our regressions, we generate dummies variables based on these different levels of hostility. There are also 4 types of civil war: 1 = civil war for central control, 2 = civil war over local issues, 3 = regional internal, and 4 = intercommunal. Again, we generate dummies for each type of civil war in our regressions.

imports. These data are obtained from various issues of Harmonized Tariff Schedule of the United States and Tariff Schedule of the United States Annotated.

Our baseline sample consists of all country-years in which these countries have positive oil reserves, which could potentially export oil to the United States. We present in Table 1 the summary statistics for the variables we use in our regressions. Several remarks are in order. First, the first row shows that even when we restrict our sample to oil countries, the variation in the size of oil imports into the United States is enormous, because the distribution of oil endowment is highly skewed. Second, the next row shows that there is also significant variation in political distance, our variable of interest. Third, trade sanctions are rare, especially export sanctions imposed by other countries on the United States. Finally, civil war in potential oil-exporting countries is not common, and militarized disputes between the United States and potential oil exporting countries are even more rare. For instance, militarized disputes between the United States and potential oil exporting countries only occur at a rate of less than 4 percent (92 out of 2432) of our sample.

The next table summarizes the pairwise correlations between different measures of distances. Consistent with intuition, political distance is positively correlated with import sanctions, geographical distance, linguistic distance, religious distance, genetic distance, and militarized disputes, and negatively correlated with international and regional trade agreements as well as colonial-tie, although none of the correlation is particularly strong (with magnitude never exceeds 0.4). GATT/WTO membership is negatively correlated with militarized disputes. Import sanctions and militarized disputes are positively correlated. Finally, geographical and various measures of cultural distances are also positively correlated.

3. Political Limits to US Oil Imports

This section examines empirically the effect of international politics (measured by political distance) on US oil imports, where import decisions are decentralized and tariffs data are available. We begin our investigation with estimating the traditional gravity model of trade, which emphasizes fixed-factors (such as geography and history) as determinants of trade, using the US crude oil imports data over the 1962-2000 period.

3.1. Distances and Oil Imports: Cross-country Evidence from Traditional Gravity Model

In its multiplicative constant-elasticity form, the gravity equation for trade states the value of oil imports from country i to the United States in year t ,¹² denoted by $M_{i,t}^{US}$ is inversely proportional to their distance $D_{i,t}^{US}$ (which typically includes all factors that might create trade resistance), and proportional to the product of the two countries' GDPs, denoted by $Y_{i,t}$ and Y_t^{US} :

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

where α , β , γ , and δ are unknown parameters, and $\eta_{i,t}^{US}$ is an error term. Provided $M_{i,t}^{US}$ is strictly positive, we can log-linearize the above equation to obtain the standard representation of gravity equation: $\ln M_{i,t}^{US} = \alpha + \beta \ln D_{i,t} + \gamma \ln Y_{i,t} + \delta \ln Y_t^{US} + \eta_{i,t}^{US}$. Our point of departure from the traditional gravity model is the focus on international politics, and hence $D_{i,t}^{US}$ measures the political distance.¹³ To take into the account that contract arrangements cover most oil transactions and also to alleviate concerns about reverse causality, in our baseline specification, $D_{i,t}^{US}$ measures the one-year lag political distance between the United States and country i . The coefficient of interest is β , the estimated impact of US foreign relations on the log of the value of oil imports into the United States.

Following the trade literature, other control variables are measured in year t . First, because crude oil exports depend on oil endowment as well as production capacity, we control for oil reserves and civil war, which may interrupt supply.¹⁴ To examine the incentives to diversify at the intensive margin as well as the extensive margin, we also control for trade sanctions, which accounts for the extensive margin. In our first specification, we also control for year fixed effects, country i 's population, as well as other standard trade resistance measures, including international and regional trade agreements, geographical distance and various measures of cultural distance. Given that our sample includes only US oil imports, adding year fixed effects captures all time-specific characteristic (e.g., global oil price, as well as US GDP, oil reserves, political distance to

¹² Once controlling for year fixed effects, using the value of oil imports is equivalent to using the quantity of oil imports in the linear model provided there is a unique world oil price. We obtain almost identical results in our probit and Poisson regressions when we use the value of oil imports divided by an index of oil price as the dependent variable.

¹³ Unlike geographical distance, our measure of political distance lies between zero and one, and hence in the regressions we use the level of political distance instead of the log of it.

¹⁴ We use oil reserves instead of oil production to control for oil endowment because production is more likely to subject to endogeneity problem. Qualitatively similar results are obtained when we replace oil reserves by oil production in our regressions. Indeed, in section 5, we report similar results when we simply use country fixed effects to capture oil endowment as well as other country-specific factors.

the rest of the world, etc.). By exploiting cross-country variation, our first specification compares the trade effect of political distance with that of other measures of resistance to trade.

A drawback of using the log-linearized form of the gravity equation is that zero trade observations are dropped from the sample. Because our focus is on oil imports and that the distribution of oil endowment is highly uneven across countries, a significant number of observations are dropped (1,185 of 2,308 potential observations). To fully capture the effects of international politics on oil imports on both the extensive and intensive margins, following Santos Silva and Tenreyro (2006), we estimate the multiplicative form (1) using the Poisson pseudo-maximum-likelihood (PPML) estimator.¹⁵ The main advantages of the PPML estimator are that while it provides a natural way to deal with zero values of the dependent variable, the estimates will be consistent even in the presence of heteroskedasticity

Table 3 compares the effects of various measures of resistance to trade on US oil imports, using different estimation methods. The first row reports the estimates of the political distance coefficient, our variable of interest. First, using probit estimation to focus on the extensive margin, column (1) shows that political distance has a negative impact on the extensive oil imports margin, although the estimate is only marginally significant. Once controlling for trade sanctions, however, the effect becomes insignificant (column (2)). Instead, the coefficient of the import sanctions dummy is highly significant, suggesting that the effect of political distance is enforced by sanctions. By contrast, when we restrict to the subsample of positive imports, simple OLS estimates show that political distance significantly impedes oil imports on the intensive margin (column (3)).

A point estimate of -1.886 from our preferred specification, which retains zero observations by directly estimating the constant-elasticity model, suggests that a two standard deviations increase in political distance (roughly the difference in the US political distance with Canada and Iran in 1980) reduces US oil imports by more than 0.7 log points (i.e. approximately 70 percent). One advantage of exploiting cross-country variation in political distance is that it allows us to compare the effect of political distance with the effect of geographical or cultural distance, which is fixed over time. The PPML estimates suggest that a two standard deviations increase in political distance

¹⁵ In a highly influential paper, Helpman, Melitz, and Rubinstein (2008) develop an international trade model with heterogeneous firms, and based on the model they propose a two-stage estimation procedure that uses an equation for selection into trade partners in the first stage and a trade flow equation in the second. The identification relies on the assumption of homoskedasticity. More importantly, their monopolistic competition model hinges on productivity differences across firms in the same country, an assumption which is not suitable for our application because the oil sector is monopolized by the state in most major oil-exporting countries.

is equivalent to an increase in geographical distance by about 70 percent or an increase of about 3,000 kilometers (evaluated at the average distance of 4,700 kilometers in our sample). In terms of historical and cultural factors, while the lack of a colonial-tie appears to reduce oil trade, cultural distance in many cases is found to increase oil imports. Finally, the effect of oil endowment is also significant.

The effect of political distance is robust to controlling for import tariffs. Economically, the estimates from column (5) suggest that the effect of political distance lies somewhat between the effects of import sanctions and WTO membership. On the other hand, a point estimate of -0.120 of the tariff coefficient implies that the effect of political distance is also similar to an increase in tariff by more than 5 cents per barrel, approximately the tariff duty imposed on most countries without signing a preferential trade agreement with the United States.

3.2. Political Distance and Oil Imports: Panel Evidence from Fixed Effects Estimates

The positive cross-country correlation between cultural distance and oil imports suggest the possibility of omitted variable bias.¹⁶ In our analysis, the key question is: How is the unobserved heterogeneity in the determinants of oil imports associated with political distance? First, it has been argued recently that institutions are in part determined by culture (e.g. Gorodnichenko and Roland, 2010; Tabellini, 2008). Second, institution quality is believed to shape political selection (Besley, 2005), which in turn may affect foreign policy. Because institution is influenced by many unobserved country-specific historical and cultural factors (Acemoglu et al. 2008), a simple cross-country correlation between political distance and oil trade can be an artifact of omitted variable bias. Moreover, the direction of the bias is ambiguous because while poor institutions are shown to slow oil extraction rates (Bohn and Deacon, 2000), and poor institutions can also weaken an oil-producing country's demand for oil.

Unlike geographical or cultural distance, political distance fluctuates over time. For example, recall from Figure 2 that the US-Iran political distance increased by two standard deviations: doubled from less than 0.4 in the 1960s to more than 0.7 in the 1980s. Substantial within-country variation in political distance over time allows us to control for omitted factors that simultaneously affect both political distance and oil trade. Including country fixed effects in our specification is also equivalent to country-pair fixed effects, which capture many of the standard

¹⁶ Baier and Bergstrand (2007), for example, show that standard cross-sectional techniques do not provide stable estimates of the effect of free trade agreement on international trade.

country-pair specific measures that are standard in gravity regressions. The log-linear form of our baseline specification, therefore, can be written as:

$$(2) \ln M_{i,t}^{US} = \alpha_t + \alpha_i + \beta \ln D_{i,t} + \gamma \ln Y_{i,t} + X_{i,t}\Gamma + \eta_{i,t}^{US} ,$$

where the vector $X_{i,t}$ includes a set of additional controls that vary across countries and years. In the full specification, $X_{i,t}$ also includes country i 's democracy score and militarized dispute between country i and the United States. We note that some of these low frequency political events, such as regime transitions and militarized disputes, are potentially endogenous to international relations. The purpose of this more stringent and demanding specification is to test whether international politics still matter for oil trade even after controlling for these violent political events.

Table 4 presents our fixed effects estimates. In the first five columns, we include in the regressions our baseline set of control variables. In the next five columns, we also control for exporter's democracy status and dummies for interstate militarized disputes. Columns (1) and (2) show that, with and without controlling for sanctions, political distance has a negative but imprecisely estimated effect on oil imports on the extensive oil import margin. However, in our fixed-effects specification, the estimates from the log-linear form (intensive margin) and the multiplicative constant-elasticity form (both extensive and intensive margins) are both economically more significant than the corresponding cross-country estimates (columns (3) and (4)). Including tariffs in the regression barely changes anything, although the estimate of the oil import tariffs coefficient is not significant in the fixed effect regression (column (5)).

Our results are also robust to adding more controls of political events. In particular, using PPML estimation ((column (9)), a coefficient of -4.103 (with standard error = 1.386, and hence significant at the 1% level) implies that a one standard deviation increase in political distance (approximately the increase in political distance between the United States and Venezuela during the Chávez administration) reduces US oil imports by more than 0.7 log points (i.e. approximately 70 percent), an effect more than double the one implied by the cross-country estimates.

One plausible interpretation of the larger estimated coefficient from the fixed-effects specification is that there are unobserved factors that impede the oil export to the United States, but are negatively correlated with political distance. Institutional quality, for instance, may be negatively correlated with oil exports over the sample period, because oil extraction began earlier and depletion rates are higher in countries with better institutions and hence higher domestic oil

demand. If these countries also have better international relations with the United States, the pooled estimates can underestimate the true effect of political distance.

The estimates of other coefficients are reported in rest of the table. In our preferred PPML estimation, both import and export sanctions significantly reduce oil trade. However, trade agreements and import tariffs are no longer important determinants of oil imports once we control for country fixed effects. The result is not too surprising, given that there is little time-series variation in these measures of economic trade barriers. Interestingly, oil endowment remains a highly significant determinant of oil exports, even after controlling for fixed effects.

We conclude this section by noting that while including year fixed effects captures the political distance between the United States and the rest of the world, it does not account for the political distance between the exporters and other countries if this distance changes over time. Given that the United States has been the leading oil importing country for decades, any bias introduced by ignoring this political remoteness to the rest of the world may be insignificant. Indeed, similar results are obtained when we include in our estimations a proxy for political remoteness, which is constructed as the GDP-share-weighted averages of the political distance between the exporter and all other countries. For instance, in our PPML specification with the full set of controls, the estimate becomes -5.094 (standard error = 1.285) when we also control for the exporter's political remoteness from the rest of the world. A more formal way to control for multilateral trade resistance by using country-year fixed effects in an extended sample that includes more than one importing country is considered in section 5.

4. Heterogeneous Effects and Simultaneity Concerns

In this section, we consider various possibilities of heterogeneous effect, lagged effect, and potential simultaneity bias.

4.1. Different Subsamples

We first examine in this section if the effect of political distance on US oil imports is more prominent over some periods than others. The first row of Table 5 replicates the results of the US imports using the full set of controls over the entire sample period 1962-2000. The second row shows that the magnitude of the PPML estimate is slightly smaller when we focus on the Cold War period (1962-1989). Excluding the years when the US government implemented the Mandatory Oil

Import Quota program (1959-1973),¹⁷ the third row shows that stronger results are obtained. The NBER-UN trade data were constructed from United Nations trade data over two periods (1962-1983 and 1984-2000). The next row shows that the estimated effects remain highly significant when we restrict the sample period the later period where the revised data from the UN Comtrade data are used.

We have argued in the introduction that one reason that the world oil market may be only partially fungible is because it is common for oil trade to be subject to state influence, given that the oil sector is monopolized by state-owned companies in many oil-rich nondemocratic countries. It has also been documented that nondemocratic countries expropriate more frequently than do democratic ones (Li, 2009). Moreover, the doctrine of democratic peace claims that democratic countries rarely fight one another. The next two rows show that indeed both the least squares and PPML results are significantly stronger when we restrict the sample to nondemocratic exporters only.¹⁸ Indeed, the estimated effects become statistically insignificant in the subsample of democratic exporters. For the rest of the table, we show that similar results are obtained when we restricts the samples by excluding observations for countries under sanctions or engaged in interstate wars.¹⁹

4.2. Accounting for Lagged Political Distance Effects and Simultaneity Concerns

In our baseline specification, we use one-year lag political distance because a vast majority of the oil sales are made by long-term contract. Table 6 reports the estimates for the effects of concurrent, lagged and future political distance. Consistent with the existence of adjustment cost, Table 6 shows that in all specifications the estimated coefficients of the lagged political distance are more significant both economically and statistically than the coefficients of the current measure. One natural interpretation is that contemporaneous oil exports rely on past drilling (and thus may not react), whereas future production and exports could be severely affected by divestment.

The expression of “oil diplomacy” refers to using oil in foreign relations to pursue a country’s international interests. One simple way to check if there is feedback effect from oil imports to political distance is to add a future level of political distance to the regression model. Contrary to the oil diplomacy argument, columns (4) and (5) of Panel A show that future level of

¹⁷ The quota system restricted the amount of crude oil and refined products imported into the United States and gave preferential treatment to oil imports from Canada, Mexico, and, somewhat later, Venezuela.

¹⁸ A country at a given year is defined as nondemocratic when her polity score less than or equal to -2, which is about the mean of the whole sample.

¹⁹ Interstate war is occurred when the hostility level is greater than or equal to 4.

political distance has a positive effect on oil imports on the extensive margin. Although the estimate of the lagged political distance from the log-linear specification remains statistically significant, Panel B suggests the possibility of reverse causality on the intensive margin.²⁰ In our preferred PPML specification that captures both the intensive and extensive margins, however, the effect of future political distance disappears (Panel C). By contrast, lagged political distance always significantly reduces oil imports. Interestingly, the result of the “kitchen-sink” specification from column (5) shows that only the two lagged political distance variables are significantly correlated with oil trade.

4.3. Using Political Leaders as an Instrument

Another way to address the potential simultaneity bias problem is to use instrumental variable method. We have seen from Figure 2 that the Iranian revolution led by Khomeini changed the US-Iran relations dramatically. It is hard to imagine the deterioration of the US-Iran relations was driven by a sudden drop in demand for the Iranian oil. A number of recent studies have shown how leadership changes, especially in nondemocratic countries, affect economic policy and political outcomes (e.g. Jones and Olken, 2005 and 2009). While Jones and Olken (2005) report that there is no robust evidence that leadership changes affect international trade growth and tariff rates, their results do not imply that political leadership has no impact on international relations and bilateral trade. Inspired by the example of the Iranian revolution, where Khomeini reached power through irregular means,²¹ we exploit similar changes in the identity of national leaders in potential oil exporting countries to construct an instrument for political distance. Here, the identification assumption is that while leaders matter for political distance, irregular leadership transitions affect bilateral oil trade only through changes in international relations.

We construct leader dummies for these leaders (and their successors if they reached power through regular means) that are not driven by foreign intervention as instrument for political

²⁰ An empirical finding that oil import leads political distance does not necessarily imply that oil trade “causes” an improvement in international relations, because trade may increase in anticipation of an improvement in international relations.

²¹ According to the political leaders dataset, Archigos (Goemans, Gleditsch, and Chiozza, 2009), leaders are selected into and leave political office in a manner prescribed by either explicit rules or established conventions. In an autocratic regime, for example, leader changes that occur through designation by an outgoing leader, hereditary succession in a monarchy, and appointment by the central committee of a ruling party would all be considered regular transfers of power from one leader to another.

distance.²² Because of the computation burden in estimating nonlinear model with instrumental variables and a large number of fixed effects, we here focus on the linear specification.²³ Table 7 reports our instrumental-variable estimates. Estimates of the first two columns of Table 7 are based on the whole sample with positive trade flows, whereas the last two columns consider the subsample where countries with irregular leadership transition imposed by foreign government are excluded. Our two-stage least square estimates are consistent with our hypothesis that political distance has a negative effect on oil imports. Indeed, given the significant increase in the magnitude of the estimated effects in the instrumented regressions, we need to consider whether such estimates are generalizable to the full set of countries, or to other potential changes in political distance. We note that when instrumenting, the coefficient of political distance is identified solely based on the variation in countries where irregular leadership transitions occur. These countries tend to be disproportionately nondemocratic. Our IV estimates are therefore consistent with our earlier finding that the estimated effect is significantly larger when we restrict the sample to nondemocratic oil-countries.²⁴ As such, changes in political distance that are driven by irregular leadership transitions may not be similar to other sources of variation in political distance. In particular, the IV estimates presented here are likely to be more applicable to changes in international relations due to leadership changes in nondemocratic countries.

5. Non-Oil Imports into the US and Other Countries' Oil Imports

We have documented a significant correlation between political distance and oil imports into the United States. The US oil sector is special in many senses. Politically, the United States is a major power with dominant military power, and oil is widely thought to be a strategic commodity. Economically, the United States is the world largest oil importer, with many American energy companies operating overseas. Unlike some other major powers, such as China, import decisions

²² To ensure that any new leadership has sufficient time to influence policy, in creating the leader dummies, we also impose the criterion the leadership has to last for more than two years. Similar results are obtained when we use different cutoffs.

²³ Another reason is that it is not uncommon for instrumental variable count models to produce imprecise estimates, especially when the first stage is not sufficiently strong (e.g. Rohlfs).

²⁴ Another possible interpretation is that to the extent that our measure of political distance is subject to measurement error, an instrumental-variable method can eliminate the attenuation bias. In any case, the purpose of our IV estimation is two-fold. First, it provides a more credible way to demonstrate the casual effect of political distance on oil imports. Second, we believe the finding that irregular change in political leadership affects oil trade is interesting in itself, because it has important foreign policy implications.

are also highly decentralized in the United States.²⁵ To what extent we can generalize our result to conclude that countries diversify their geographical sources of imports away from their political opponents?

5.1. Is Oil Unique?

Given that the number of commodities that are internationally traded is enormous, to avoid being arbitrary, we first use the 10 trade aggregates that are employed by Leamer (1984). These 10 aggregates (namely, petroleum, raw materials, forest products, tropical agriculture, animal products, cereals, etc., labor intensive, capital intensive, machinery, and chemicals) are formed from the 61 2-digit SITC commodity classes, based on the idea that commodities within a class behave similarly in international trade. To supplement Leamer's classification, we also consider 3 additional broader categories of goods due to Rauch (1999): namely, organized exchange, reference priced, and differentiated commodities.²⁶ To show the most conservative estimates, in all regressions, we include country fixed effects as well as the full set of controls (except import tariffs and endowment, where data are unavailable) in our estimations.

We summarize our results based on probit, OLS, and PPML estimations in Table 8. Consistent with our previous results, row (1) shows that political distance impedes crude oil imports into the United States, although the effect is slightly weaker when we use the sample of all countries without directly controlling for exporter's oil endowment, as expected. Row (2) reports the results using petroleum imports as the dependent variable, which includes both crude petroleum and petroleum products. The estimates are also less precise in this case, although the PPML estimate remains significant.

The third row reports that while the least squares estimate suggests a negative relationship between political distance and the US raw materials imports (which includes imports of some strategic minerals that are extracted by companies facing expropriation risk), the effect is insignificant according to the PPML estimate. The rest of the table shows that in general there is no robust relationship between political distance and imports of other trade aggregates according to Leamer's classification, except for chemicals (which includes explosives and pyrotechnic products).

²⁵ According to the EIA, for example, there are more than 40 companies importing crude oil from almost 30 countries into the United States In January 2011.

²⁶ Crude oil is an organized exchange commodity. To focus on the impact of political distance on the import of other commodities, we exclude crude oil in the classification.

Moreover, the absolute value of the point estimate almost never exceeds one.²⁷ Note that none of these trade aggregates are highly vertically integrated or subject to severe expropriation risk.

In contrast to the market view of international trade, the network/search view of international trade argues that proximity and preexisting ties are more important for differentiated (or complex) products than for simple products traded on organized exchanges, because search barriers to trade are higher for differentiated than for homogeneous products (Rauch, 1999). We have seen that political network (measured by political distance) significantly affects import of crude oil, a commodity traded on organized exchanges. The last three rows show that, when we exclude crude oil and focus on the extensive margin, political distance reduces US import of trade aggregates according to Rauch's classification. However, once we consider both margins, political distance only impedes import of reference prices commodities, which include chemicals and some other strategic raw materials. The magnitude of the effect, however, is significantly smaller than in the case of crude oil. These findings suggest that, especially on the intensive margin, political network and social network have different trade effects on different types of goods.

5.2. Is the United States Unique?

Political scientists believe that major powers play a decisive role in international conflicts. To the extent that their stakes are higher, importers in major powers should have stronger incentives to diversify their trading partners. On the other hand, major powers countries also tend to have oil companies investing heavily overseas.

We repeat our exercise using oil imports data from the top 10 oil importing countries in 1980. Table 9 reports the fixed effects estimates of the impact of political distance on oil imports into these 10 countries. Once again, we control for fixed effects and the full set of controls, but here we do not control for import tariffs because of data availability for other countries. The first five rows report the estimated coefficients for the countries classified as major powers according to the Correlates of War Project.²⁸ According to the Petroleum Intelligence Weekly, on the other hand, among the top 10 largest oil companies in 2008, 7 of them are international ones owned by companies from 4 major power countries: namely, China, France, the United Kingdom, and the

²⁷ In addition to trade aggregates, we also experiment with import of other individual goods. For example, the PPML estimates for coffee (SITC code = 0711) and steel (SITC code = 671) imports are respectively 0.235 (standard error = 0.638) and -0.091 (standard error = 0.548), and hence highly insignificant.

²⁸ Note that four of them, namely China, France, the United Kingdom, and the United States, are also permanent members of the United Nations Security Council.

United States.²⁹ The only non-major power top oil importer with global oil giant operating overseas is Netherlands.

Row (1) replicates the results of the US imports. Row (2) reports that in the case of the United Kingdom the effect appears to be slightly weaker. The next three rows show that while the effect is only significant for the extensive margin in France, the effect is significant in both Japan and China according to the PPML estimates. With the exception of France, it is interesting to note while the ownership and market structure of the oil sector differ significantly across these countries, both private and national oil companies appear to respond to international politics when deciding their sources of oil imports.

The next five rows report the effect for other major oil importing countries that are not major powers. According to our preferred PPML estimator, a significant negative effect is observed only in the case of Netherlands, where the global oil giant Royal-Dutch Shell was founded. The estimated coefficients are positive for Italy, Spain, South Korean, and India, although none of them is significant. On the other hand, the probit estimates suggest that political distance impedes oil imports into Spain and India on the extensive margin.

In the last specification we pool all the 10 importing countries into one sample. A major advantage of this specification is that it allows us to account for time-varying multilateral trade resistance by controlling for both importer-year and exporter-year fixed effects. However, given the computation burden in estimating nonlinear models with a large number of fixed effects, we focus on the linear specification. Given the heterogeneity effects of political distance, we also control for the interaction between political distance and major power status of the importers. Consistent with the results above, the last row shows that political distance significantly reduces oil imports into major power countries but it has no effect for non-major powers, and hence our major finding is robust to controlling for multilateral trade resistance.³⁰

6. Interpretations and Concluding Remarks

A significant negative association between political distance and oil imports into major powers can be interpreted as either political diversification or oil diplomacy. In both cases, our finding is consistent with the view that oil imports into major powers and international politics are intimately

²⁹ The remaining 3 companies are state-owned ones from Saudi Arabia, Iran, and Venezuela. According to the OECD data, in 2008, the United States, the United Kingdom, and France are also among the top 5 countries in their outward FDI in the extraction of crude petroleum and natural gas.

³⁰ Without controlling for the interaction term, the estimated coefficient is -3.055 (standard error = 1.024), and hence it is significant at the 1% level.

related. While we do not completely rule out the possibility of reverse causality, our stylized examples and the timing of the changes in relations relative to trade in our regressions (especially when they are driven by political leadership turnover) suggest that international relations affect oil trade.³¹ Moreover, in the case of the United States where import decisions are highly decentralized, it is natural to interpret our results as oil companies responding to changes in geopolitical risks driven by changes in international politics. Given that our findings are robust to controlling for economic sanctions, import tariffs, and militarized disputes, the political oil import diversification is more than an outcome of government intervention or a wartime phenomenon. In other words, the political limits on world oil trade that we focus on are distinct from a disruption effect, and we demonstrate this by showing that the effect survives even when all countries engaged in militarized dispute are excluded from the sample.

Why does political distance reduce import of oil but not other goods? When both importers and exporters are national oil companies, it is less difficult to understand that trade in such a “strategic commodity” is subject to state influence (e.g. the China-Venezuela oil deal).³² Political scientists have long recognized that institutions and conducts of political leaders affect foreign direct investment (e.g. Jensen, 2003). Historically, investments in extractive industries have been exposed to higher expropriation risk, and in many instances both expropriation and compensation were selective (i.e. focus on specific firms or industries). Figure 4 suggests that even when import decisions are decentralized, major US oil companies’ foreign investment (measured by net ownership interest oil reserves) may be subject to political influence.³³ In particular, the decline in US oil activities in both Africa and the Middle East in the 1980s are consistent with the deterioration of the US-Libya and US-Iran relations. More recently, the increase and decrease in US oil activities in the Middle East and other Western Hemisphere (mainly Venezuela and Mexico)

³¹ Interestingly, Alesina and Dollar (2000) also prefer to interpret the association between foreign aid and UN vote pattern as donors favoring their political alliances in disbursing aid, instead of aid being used to buy political support in the United Nations, partly because many UN votes are not very important per se.

³² The round trip voyage from Venezuela to the US Gulf ports is almost five times shorter than that to China, and hence any effort to diversify Venezuelan oil sales away from the United States to China does not appear to be cost effective. After all, it appears more than political rhetoric, when China deposits \$8 billion in an infrastructure development fund in exchange for Venezuelan oil.

³³ The data are obtained from the Financial Reporting System (FRS) survey, which is conducted by the EIA. The dataset contains worldwide financial and operating information for the major energy-producing companies based in the United States. Net ownership interest is defined as net working interest plus own royalty interest.

respectively also coincide with the collapse of the Iraqi regime of Saddam Hussein and the rise of Chavez.³⁴

Given the high correlation between being a major power and having oil companies operating overseas, however, it is difficult to disentangle the effects of political risk of interstate conflict from the economic cost when appropriate quasi rents are important. The cases of Japan (a major power with oil investment overseas only at a modest scale) and Netherlands (a non-major power with large oil investment overseas) suggest that perhaps both forces are at work.³⁵ Not all energy companies based in the United States are vertically integrated with exploration investment overseas. A detailed firm-level analysis of oil import pattern and investment activities overseas can help quantifying the economic cost of potential holdup. A more careful analysis of the industrial structure of other raw materials, chemicals, and reference priced goods, where a smaller effect of political distance on trade is observed, is also a fruitful direction to pursue.

Our paper adds to the growing literature of the role of politics in international trade. The evidence we presented suggest that even when import decisions are decentralized bilateral trade can be subject to influence of international politics, with an important qualification that the effects are heterogeneous across both countries and commodities. It is not a new idea that trade resistances have heterogeneous effects on trade, depending on the characteristics of the importers and exporters, as well as the types of goods.³⁶ Klein, Crawford, and Alchian (1978) describe the petroleum industry as one in which appropriable quasi rents exist in specific assets of oil fields, refineries, and pipelines.³⁷ Our results suggest that although organized market exists to facilitate

³⁴ ExxonMobil Corporation and ConocoPhillips, two of the largest US oil companies, abandoned their multibillion-dollar investments in the heavy oil deposits in Venezuela following the breakdown of the negotiations with Hugo Chavez's government in 2007. While ExxonMobil and ConocoPhillips refused to reduce their stakes that would enable them to keep pumping oil in Venezuela, BP of Britain, Chevron of the United States, Statoil of Norway, and Total of France negotiated deals with Venezuela's state oil company to continue on as minority partners.

³⁵ The case of China is similar to Japan, because foreign investment from China's oil companies was indeed smaller than investment from Japan over the sample period.

³⁶ For instance, institution quality of importers (Anderson and Macrouiller, 2002) and exporters (Berkowitz, Moenius, and Pistor, 2006) are shown to affect trade pattern. In particular, the latter paper finds that countries with good legal institutions export more complex (or differentiated) goods and import more simple ones, such as crude oil. Similarly, Nunn (2007) shows that countries with good contract enforcement specialize in exporting goods that require intermediate inputs in which their markets are thin and hence relationship-specific investments are important.

³⁷ However, based on Rauch's classification, both oil gas extraction and petroleum refineries are classified as the least contract intensive industries in Nunn (2007).

trade in crude oil among strangers, overseas oil investments are subject to political risk, so that the identity of trade partners still matters.³⁸

When oil companies in major powers do not minimize their transportation cost of oil imports, we have identified a political cost of oil dependence even in the absence of foreign intervention or interstate war. Quantifying this cost of oil dependence provides a useful step towards a better understanding of the relationship between energy policy and foreign policy. However, we should emphasize that it is not our contention that such a political oil import diversification is necessary inefficient. On the contrary, to the extent that there are security externalities due to supply disruptions, the import diversification can be viewed as a means of internalizing the externalities. An evaluation of the efficiency implications for energy policy requires (a) a careful distinction between cases in which import decisions are decentralized and those where import is controlled by the government; (b) a general equilibrium framework that specifies the alternative trading pattern and in particular the cost of substitution when oil importers do not minimize transportation costs; and (c) estimates of the direct benefit as well as other possible political side payments of import diversification.

³⁸ Our results also suggest that when country-pair (instead of country-level) specific risk of doing business is a key determinant of trade, previous classification of goods may need to be reexamined: either we argue that relation-specificity is indeed important in oil industry, or we may have to conclude that oil is special because it is a strategic good traded under the veil of unobserved government intervention.

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Table 1
Summary Statistics for US Oil Imports, Distances, and Other Exporters' Characteristics

Variable	Mean	Std. Dev.	Min	Max	Observations
Oil Imports	474671	1454310	0	14800000	2421
Political distance	0.528	0.190	0	1	2421
Import sanctions	0.022	0.148	0	1	2421
Export sanctions	0.011	0.103	0	1	2421
GATT/WTO membership	0.640	0.480	0	1	2421
Regional trade agreement	0.014	0.118	0	1	2421
Oil import tariffs	5.865	3.480	0.000	21.000	1728
Log geographical distance	8.975	0.528	6.307	9.692	2308
Colonial-tie	0.061	0.240	0	1	2308
Linguistic distance	0.854	0.152	0.520	1.000	2308
Religious distance	0.725	0.260	0.324	1.000	2308
Genetic distance	0.070	0.071	0.000	0.229	2308
Log exporter's GDP	8.713	1.064	5.744	11.489	2421
Log exporter's population	9.662	1.591	4.901	14.054	2421
Log exporter's oil reserves	-0.021	3.004	-9.498	5.591	2421
Exporter's democracy	-0.162	7.801	-10	10	2421
Civil war	1.568	0.707	1	4	292
Militarized interstate disputes	3.739	0.489	2	4	92

Notes: The raw data of the militarized disputes variable can take 5 values, depended on the hostility level of dispute: 1 = no militarized action, 2 = threat to use force, 3 = display of force, 4 = use of force, and 5 = war. There are also 4 types of civil war: 1 = civil war for central control, 2 = civil war over local issues, 3 = regional internal, and 4 = intercommunal.

Table 2
Pairwise Correlations Between Various Distance Measures

	Political distance	Import sanctions	Export sanctions	GATT/WTO membership	Regional trade agreement	Log geographical distance	Colonial-tie	Linguistic distance	Religious distance	Genetic distance	Militarized disputes
Political distance	1.000										
Import sanctions	0.142	1.000									
Export sanctions	-0.027	-0.016	1.000								
GATT/WTO membership	-0.164	-0.066	-0.104	1.000							
Regional trade agreement	-0.097	-0.019	-0.013	0.090	1.000						
Log geographical distance	0.179	-0.040	0.022	-0.054	-0.244	1.000					
Colonial-tie	-0.226	-0.040	-0.026	0.169	-0.031	-0.075	1.000				
Linguistic distance	0.362	0.001	0.074	-0.307	-0.024	0.424	-0.219	1.000			
Religious distance	0.306	0.040	0.105	-0.284	-0.024	0.481	-0.300	0.609	1.000		
Genetic distance	0.224	-0.006	-0.065	0.082	-0.059	0.218	-0.175	0.506	0.061	1.000	
Militarized disputes	0.061	0.245	0.046	-0.159	0.043	-0.081	-0.046	0.030	0.065	-0.063	1.000

Table 3
Distances and US Oil Imports: Cross-Country Comparison

<u>Dependent Variable</u>	Probit $1\{M_{i,t}^{US} > 0\}$ (1)	Probit $1\{M_{i,t}^{US} > 0\}$ (2)	OLS $\ln M_{i,t}^{US}$ (3)	PPML $M_{i,t}^{US}$ (4)	PPML $M_{i,t}^{US}$ (5)
<u>Political Distance</u>					
Political distance (UNGA voting)	-0.238* (0.130)	-0.142 (0.133)	-2.272*** (0.744)	-1.886*** (0.549)	-1.685*** (0.580)
Import sanctions dummy		-0.375*** (0.034)	-0.223 (0.620)	-0.461** (0.198)	-0.701*** (0.245)
Export sanctions dummy		0.115 (0.156)	0.040 (0.665)	-0.958** (0.434)	
<u>Economic Distance</u>					
GATT/WTO membership dummy	0.152*** (0.031)	0.135*** (0.032)	0.070 (0.132)	0.586*** (0.089)	0.565*** (0.091)
Regional trade agreement dummy	-0.120** (0.053)	-0.122** (0.052)	0.490*** (0.189)	0.064 (0.112)	-0.069 (0.111)
Oil import tariffs					-0.120*** (0.019)
<u>Geographical Distance</u>					
Log geographical distance	-0.361*** (0.037)	-0.383*** (0.039)	-1.072*** (0.100)	-1.060*** (0.082)	-0.908*** (0.089)
<u>Historical Relations</u>					
Colonial-tie dummy	0.074 (0.060)	0.071 (0.061)	0.658** (0.305)	1.283*** (0.275)	1.261*** (0.282)
<u>Cultural Distance</u>					
Linguistic distance	0.179 (0.145)	0.068 (0.144)	0.317 (0.642)	3.147*** (0.850)	2.945*** (0.890)
Religious distance	0.174** (0.075)	0.212*** (0.075)	-0.111 (0.289)	-0.404 (0.263)	-0.568** (0.278)
Genetic distance	2.663*** (0.249)	2.844*** (0.256)	11.751*** (0.887)	9.747*** (1.059)	9.695*** (1.107)
<u>Other Gravity Controls</u>					
Log exporter's GDP	0.079*** (0.021)	0.086*** (0.021)	-0.094 (0.087)	-0.052 (0.067)	-0.038 (0.069)
Log exporter's population	0.014 (0.011)	0.023** (0.011)	-0.057 (0.042)	-0.064* (0.033)	-0.034 (0.034)
Log exporter's oil reserves	0.148*** (0.007)	0.150*** (0.007)	0.854*** (0.031)	1.049*** (0.037)	1.036*** (0.037)
<u>Additional Controls</u>					
Civil war dummies	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes
Observations	2,307	2,307	1,116	2,308	1,642
R ²	0.356	0.367	0.673	0.810	0.794

Notes: Column (5) uses data only from 1976-2000. Robust standard errors are reported in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4
Political Distance and US Oil Imports: Fixed Effects Estimates

Dependent Variable	FE-Probit $1\{M_{i,t}^{US} > 0\}$ (1)	FE-Probit $1\{M_{i,t}^{US} > 0\}$ (2)	FE-OLS $\ln M_{i,t}^{US}$ (3)	FE-PPML $M_{i,t}^{US}$ (4)	FE-PPML $M_{i,t}^{US}$ (5)	FE-Probit $1\{M_{i,t}^{US} > 0\}$ (6)	FE-Probit $1\{M_{i,t}^{US} > 0\}$ (7)	FE-OLS $\ln M_{i,t}^{US}$ (8)	FE-PPML $M_{i,t}^{US}$ (9)	FE-PPML $M_{i,t}^{US}$ (10)
Political distance (UNGA voting)	-0.459 (0.301)	-0.325 (0.272)	-3.157** (1.380)	-4.103*** (1.386)	-4.333*** (1.440)	-0.443 (0.294)	-0.323 (0.270)	-3.228** (1.396)	-4.400*** (1.327)	-4.704*** (1.365)
Import sanctions dummy		-0.429*** (0.030)	-0.821 (0.899)	-1.275*** (0.331)	-1.243*** (0.417)		-0.421*** (0.031)	-0.893 (1.044)	-1.279*** (0.305)	-1.180*** (0.387)
Export sanctions dummy		0.023 (0.226)	0.060 (0.730)	-0.958** (0.299)			0.028 (0.225)	0.034 (0.742)	-0.905*** (0.325)	
GATT/WTO membership dummy	0.049 (0.132)	0.033 (0.128)	-0.243 (0.380)	0.359 (0.268)	0.335 (0.316)	0.053 (0.131)	0.038 (0.127)	-0.221 (0.384)	0.362 (0.255)	0.343 (0.292)
Regional trade agreement dummy	-0.245 (0.159)	-0.239 (0.156)	0.325 (0.511)	-0.030 (0.149)	0.056 (0.166)	0.053 (0.131)	-0.237 (0.160)	0.319 (0.534)	0.002 (0.178)	0.154 (0.175)
Oil import tariffs					-0.009 (0.054)					0.001 (0.056)
Log exporter's GDP	0.392** (0.171)	0.352** (0.174)	0.017 (0.330)	0.366 (0.594)	0.420 (0.659)	0.370** (0.174)	0.340* (0.175)	0.028 (0.334)	0.423 (0.594)	0.479 (0.647)
Log exporter's population	0.154 (0.285)	0.178 (0.290)	-0.958 (0.993)	-0.187 (1.038)	-0.271 (1.150)	0.143 (0.288)	0.168 (0.294)	-0.966 (0.992)	-0.131 (1.038)	-0.221 (1.135)
Log exporter's oil reserves	0.167*** (0.032)	0.166*** (0.032)	0.853*** (0.174)	1.417*** (0.229)	1.342*** (0.283)	0.166*** (0.032)	0.166*** (0.031)	0.859*** (0.176)	1.426*** (0.219)	1.335*** (0.271)
Additional controls										
Civil war dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes
Exporter's democracy	no	no	no	no	no	yes	yes	yes	yes	Yes
Militarized interstate disputes	no	no	no	no	no	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations (# of countries)	1,873 (57)	1,873 (57)	1,150 (65)	2,421 (82)	1,725 (81)	1,871 (57)	1,871 (57)	1,150 (65)	2,421 (82)	1,725 (81)
R ²	0.408	0.414	0.769	.	.	0.410	0.415	0.770	.	.

Notes: Columns (5) and (10) use data only from 1976-2000. Robust standard errors clustered at the country level are reported in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
Political Distance and US Oil Imports: Different Subsamples and Subperiods

	FE-Probit (1)	FE-OLS (2)	FE-PPML (3)
<u>Baseline Specification</u>	-0.323 (0.270) [1,871, 57; 0.415]	-3.228** (1.396) [1,150, 65; 0.770]	-4.398*** (1.327) [2,421, 82]
<u>Cold War Period (1962-1989)</u>	-0.507 (0.339) [1,215, 50; 0.433]	-3.404* (1.944) [745, 57; 0.805]	-3.825** (1.620) [1,606, 72]
<u>Post-Oil Import Quota Era (1974-2000)</u>	-1.189** (0.583) [1,209, 50; 0.413]	-5.013** (2.103) [939, 64; 0.742]	-4.521*** (1.349) [1,839, 81]
<u>UN Comtrade Data (1984-2000)</u>	-1.169 (0.877) [598, 38; 0.328]	-5.437** (2.284) [629, 60; 0.812]	-3.819*** (1.227) [1,217, 80]
<u>Nondemocratic Exporters</u>	-0.829 (0.512) [826, 34; 0.495]	-3.599** (1.574) [601, 40; 0.766]	-6.426*** (1.930) [1,269, 58]
<u>Democratic Exporters</u>	-0.896 (0.550) [890, 35; 0.425]	-2.279 (2.343) [549, 44; 0.818]	-2.374 (1.497) [1,152, 55]
<u>Excluding Observations with Sanctions</u>	-0.358 (0.269) [1,823, 57; 0.423]	-2.759** (1.377) [1,119, 65; 0.783]	-4.308*** (1.390) [2,341, 81]
<u>Excluding Observations with Interstate War</u>	-0.264 (0.265) [1,815, 57; 0.422]	-3.197** (1.417) [1,116, 65; 0.771]	-4.211*** (1.099) [2,351, 82]
<u>Excluding Exporters that Ever be at War with</u>	-0.362 (0.274) [1,518, 47; 0.421]	-3.526** (1.699) [895, 52; 0.784]	-3.738*** (1.068) [1,942, 66]

Notes: Robust standard errors clustered at the country level are reported in parentheses. The number of observations, the number of countries, and R² are reported in squared brackets. All regressions control for political distance, import and export sanctions dummies, GATT/WTO membership dummy, regional trade agreement dummy, log exporter's GDP, log exporter's population, civil war dummies, exporter's democracy, militarized interstate disputes, year and country fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6
Political Distance and US Oil Imports: Lagged Effects

	(1)	(2)	(3)	(4)	(5)
Panel A: Fixed Effects Probit Estimation					
Political distance _t	-0.080 (0.300)				-0.093 (0.240)
Political distance _{t-1}		-0.323 (0.270)		-0.662 ^{***} (0.246)	-0.233 (0.239)
Political distance _{t-2}			-0.600 [*] (0.311)		-0.784 ^{**} (0.376)
Political distance _{t+1}				0.685 ^{**} (0.330)	0.886 ^{***} (0.338)
Observations (# of countries)	1,877 (57)	1,871 (57)	1,864 (57)	1,871 (57)	1,864 (57)
R ²	0.413	0.415	0.416	0.417	0.419
Panel B: Fixed Effects OLS Estimation					
Political distance _t	-2.755 ^{**} (1.342)				-0.317 (1.006)
Political distance _{t-1}		-3.228 ^{**} (1.396)		-2.272 [*] (1.147)	-1.175 (0.817)
Political distance _{t-2}			-2.902 ^{**} (1.190)		-1.370 [*] (0.810)
Political distance _{t+1}				-2.526 ^{**} (1.013)	-2.127 ^{**} (1.042)
Observations (# of countries)	1,156 (65)	1,150 (65)	1,145 (65)	1,150 (65)	1,145 (65)
R ²	0.769	0.770	0.769	0.771	0.772
Panel C: Fixed Effects PPML Estimation					
Political distance _t	-2.776 ^{**} (1.263)				0.086 (0.468)
Political distance _{t-1}		-4.400 ^{***} (1.327)		-4.047 ^{***} (1.120)	-2.842 ^{***} (0.939)
Political distance _{t-2}			-4.295 ^{***} (1.162)		-2.916 ^{***} (0.808)
Political distance _{t+1}				-0.862 (1.212)	-0.314 (1.097)
Observations (# of countries)	2,432 (82)	2,421 (82)	2,409 (82)	2,421 (82)	2,409 (82)

Notes: Robust standard errors clustered at the country level are reported in parentheses. All regressions control for political distance, import and export sanctions dummies, GATT/WTO membership dummy, regional trade agreement dummy, log exporter's GDP, log exporter's population, civil war dummies, exporter's democracy, militarized interstate disputes, year and country fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7
Political Distance and US Oil Imports: Instrumental-Variable Estimates

	2SLS (1)	FE-2SLS (2)	2SLS (3)	FE-2SLS (4)
<u>Political Distance</u>	-6.504 ^{***}	-5.576	-6.397 ^{***}	-6.052 ^{**}
Political distance	(1.332)	(3.449)	(1.356)	(2.848)
Import sanctions dummy	-0.246 (0.600)	-0.410 (1.145)	-0.220 (0.583)	-0.657 (0.870)
Export sanctions dummy	0.119 (0.618)	0.192 (0.671)	0.371 (0.636)	0.082 (0.763)
<u>Economic Distance</u>				
GATT/WTO membership dummy	-0.063 (0.129)	-0.197 (0.387)	0.185 (0.135)	-0.007 (0.377)
Regional trade agreement dummy	0.540 ^{**} (0.219)	0.620 (0.469)	0.604 ^{***} (0.222)	0.492 (0.513)
<u>Geographical Distance</u>				
Log geographical distance	-0.994 ^{***} (0.104)		-0.969 ^{***} (0.105)	
<u>Historical Relations</u>				
Colonial-tie dummy	0.290 (0.338)		0.362 (0.339)	
<u>Cultural Distance</u>				
Linguistic distance	1.148 (0.777)		1.887 ^{**} (0.817)	
Religious distance	0.064 (0.295)		-0.049 (0.299)	
Genetic distance	11.799 ^{***} (0.913)		11.655 ^{***} (0.926)	
<u>Other Gravity Controls</u>				
Log exporter's GDP	-0.357 ^{***} (0.113)	-1.034 ^{***} (0.377)	-0.284 ^{**} (0.117)	-0.200 (0.289)
Log exporter's population	-0.162 ^{***} (0.050)	-0.380 (0.327)	-0.217 ^{***} (0.051)	-1.761 ^{***} (0.458)
Log exporter's oil reserves	0.934 ^{***} (0.038)	0.752 ^{***} (0.201)	0.966 ^{***} (0.038)	0.788 ^{***} (0.111)
<u>Additional Controls</u>				
Civil war dummies	yes	yes	yes	yes
Exporter's democracy	no	yes	no	yes
Militarized interstate disputes	no	yes	no	yes
Year fixed effects	yes	yes	yes	yes
Country fixed effects	no	yes	no	yes
Number of instruments	69	50	68	50
1st-stage (Kleibergen-Paap) F statistics	39.13	33.318	41.84	51,180
Hansen J statistics	183.8	37.08	183.4	28.37
Observations (# of countries)	1,103 (61)	1,137 (65)	1,041 (59)	1,076 (63)
R ²	0.537	0.091	0.559	0.223

Notes: The instruments are dummies variables for leaders who reached power through irregular means. Estimates of the first two columns of are based on the whole sample with positive trade flows, whereas the last two columns consider the subsample where countries with irregular leadership transition imposed by foreign government are excluded. For columns (1) and (3), robust standard errors are reported in parentheses. For columns (2) and (4), robust standard errors clustered at the country level are reported in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8
Political Distance and US Imports of Various Trade Aggregates

	FE-Probit	FE-OLS	FE-PPML
	(1)	(2)	(3)
<u>Crude Oil</u>	-0.308 (0.258) [2,779, 80; 0.416]	-2.693* (1.458) [1,230, 88; 0.776]	-3.690** (1.755) [4,977, 158]
<u>Petroleum</u>	-0.262 (0.258) [3,484, 105; 0.468]	-1.223 (1.198) [2,253, 124; 0.812]	-3.005** (1.449) [4,977, 158]
<u>Raw Materials</u>	-0.507 (0.350) [2,918, 91; 0.420]	-1.569** (0.634) [3,333, 143; 0.819]	-0.013 (0.442) [4,977, 158]
<u>Forest Products</u>	-0.418 (0.285) [2,654, 82; 0.550]	1.197 (0.740) [2,877, 128; 0.871]	0.478 (0.585) [4,977, 158]
<u>Tropical Agriculture</u>	-0.532 (0.397) [2,337, 76; 0.457]	-0.231 (0.527) [3,629, 143; 0.878]	0.200 (0.271) [4,977, 158]
<u>Animal Products</u>	-0.276 (0.271) [2,497, 77; 0.428]	0.122 (0.556) [3,744, 145; 0.884]	0.713** (0.361) [4,977, 158]
<u>Cereals, etc.</u>	-0.813** (0.357) [2,744, 86; 0.463]	0.312 (0.574) [3,226, 137; 0.797]	-0.021 (0.496) [4,977, 158]
<u>Labor Intensive</u>	-0.467*** (0.131) [2,299, 71; 0.471]	0.151 (0.480) [4,235, 149; 0.898]	0.090 (0.603) [4,977, 158]
<u>Capital Intensive</u>	-0.359 (0.251) [2,967, 91; 0.451]	0.133 (0.789) [3,216, 146; 0.905]	-0.482 (0.392) [4,977, 158]
<u>Machinery</u>	-0.247 (0.175) [3,335, 99; 0.452]	-0.782 (0.627) [2,153, 131; 0.936]	-0.141 (0.297) [4,977, 158]
<u>Chemicals</u>	-0.025 (0.249) [2,952, 90; 0.452]	-0.962* (0.542) [3,115, 144; 0.882]	-0.684** (0.297) [4,977, 158]
<u>Organized Exchange (excluding Crude Oil)</u>	-0.444* (0.268) [3,018, 95; 0.427]	0.027 (0.669) [3,454, 145; 0.790]	-0.042 (0.452) [4,977, 158]
<u>Reference Priced Goods</u>	-0.535** (0.215) [2,500, 78; 0.400]	-1.471** (0.644) [3,915, 147; 0.858]	-0.601** (0.287) [4,977, 158]
<u>Differentiated Products</u>	-0.242*** (0.090) [2,064, 61; 0.438]	0.164 (0.477) [4,419, 149; 0.917]	-0.599 (0.382) [4,977, 158]

Notes: Robust standard errors clustered at the country level are reported in parentheses. The number of observations, the number of countries, and R^2 are reported in squared brackets. All regressions control for political distance, import and export sanctions dummies, GATT/WTO membership dummy, regional trade agreement dummy, log exporter's GDP, log exporter's population, civil war dummies, exporter's democracy, militarized interstate disputes, year and country fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9
Political Distance and Oil Imports into Other Countries

	FE-Probit (1)	FE-OLS (2)	FE-PPML (3)
<u>United States</u>	-0.323 (0.270) [1,871, 57; 0.415]	-3.228** (1.396) [1,150, 65; 0.770]	-4.400*** (1.327) [2,421, 82]
<u>United Kingdom</u>	-0.996** (0.494) [1,439, 42; 0.416]	-2.109 (1.305) [728, 48; 0.745]	-2.783*** (1.019) [2,421, 82]
<u>France</u>	-1.310** (0.562) [1,261, 41; 0.556]	0.793 (1.803) [740, 49; 0.806]	0.111 (1.083) [2,421, 82]
<u>Japan</u>	-0.663 (0.506) [1,188, 34; 0.352]	-2.170 (2.519) [616, 42; 0.827]	-3.387** (1.478) [2,421, 82]
<u>China</u>	-0.308 (0.616) [738, 36; 0.545]	-1.436 (5.585) [220, 37; 0.787]	-5.532* (3.022) [2,382, 81]
<u>Italy</u>	-0.367 (0.260) [1,592, 53; 0.398]	0.574 (1.669) [740, 62; 0.846]	0.609 (1.289) [2,421, 82]
<u>Spain</u>	-1.168*** (0.350) [1,579, 49; 0.477]	-0.707 (1.179) [641, 54; 0.823]	0.431 (1.245) [2,424, 82]
<u>Netherlands</u>	0.037 (0.583) [1,267, 36; 0.450]	-0.498 (2.365) [638, 41; 0.740]	-2.179** (0.886) [2,421, 82]
<u>South Korea</u>	-1.108 (0.685) [1,408, 44; 0.513]	0.323 (4.368) [456, 45; 0.834]	0.047 (3.629) [2,421, 82]
<u>India</u>	-1.193*** (0.342) [550, 21; 0.531]	6.131* (3.404) [178, 21; 0.902]	3.949 (3.864) [2,421, 82]
<u>Top 10 Importers</u>			
Political distance		-6.212*** (1.301)	
× Major powers		1.583 (1.165)	
Political distance			[6,610, 615; 0.778]

Notes: Except for the last specification, robust standard errors clustered at the country level are reported in parentheses. In the last specification, robust standard errors clustered at the country-pair level are reported. The number of observations, the number of countries (the number of county-pairs for the last specification), and R^2 are reported in squared brackets. Except for the last specification, all regressions control for political distance, import and export sanctions dummies, GATT/WTO membership dummy, regional trade agreement dummy, log exporter's GDP, log exporter's population, log exporter's oil reserve, civil war dummies, exporter's democracy, militarized interstate disputes, year and country fixed effects. In the last specification, we control for political distance, interaction of political distance and major power dummies, import and export sanctions dummies, regional trade agreement dummy, militarized interstate disputes, as well as importer-year fixed effects and exporter-year fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%.

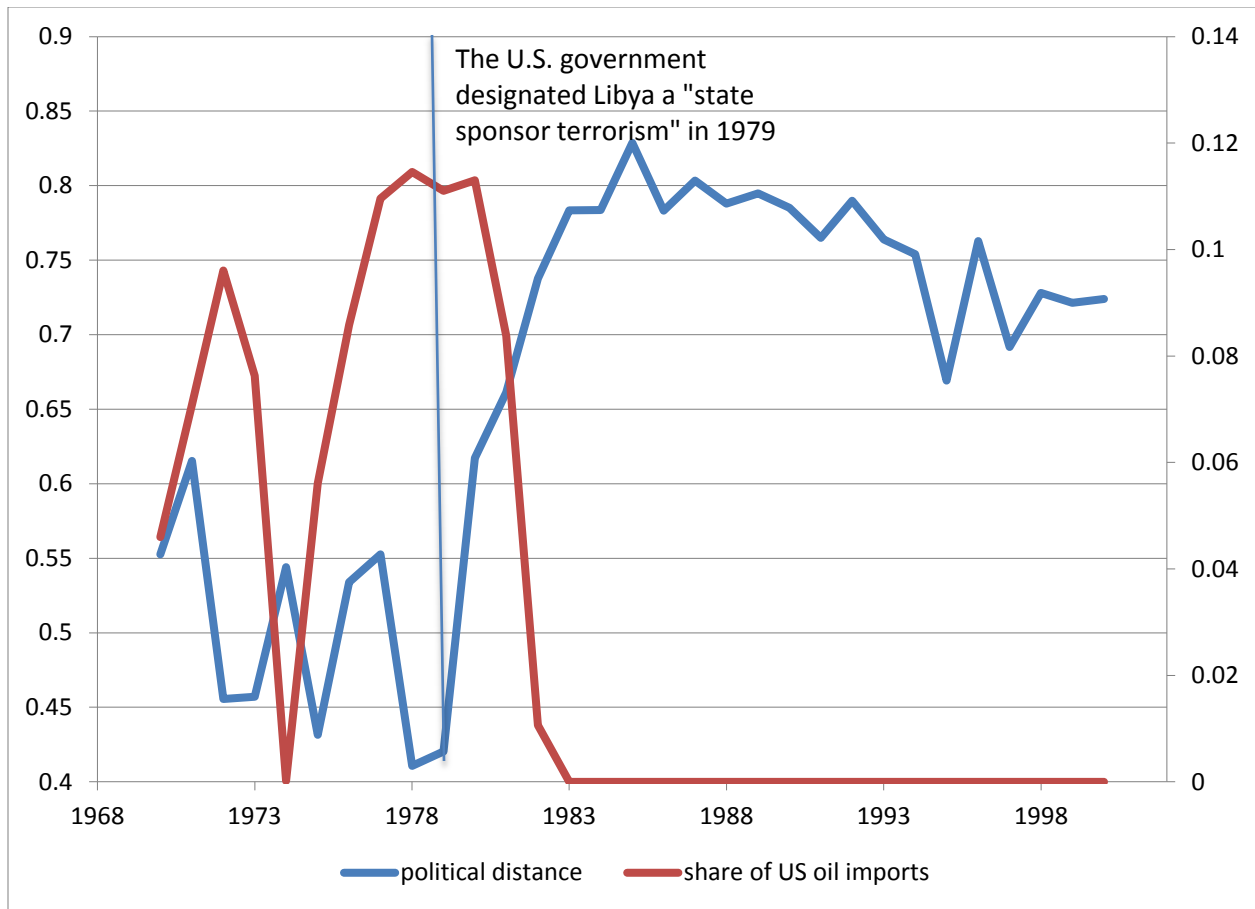


Figure 1
Political Distance and Oil Imports from Libya

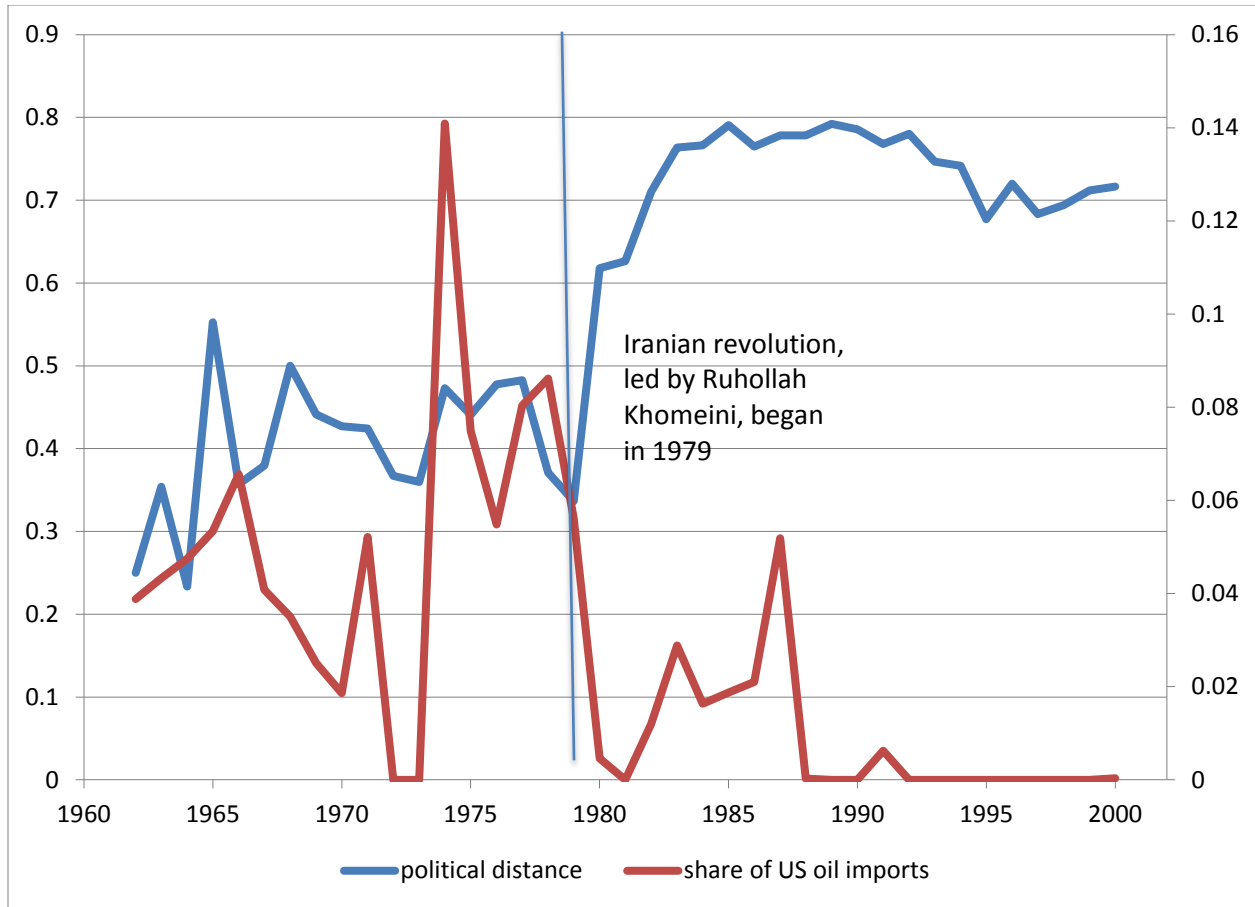


Figure 2
Political Distance and Oil Imports from Iran

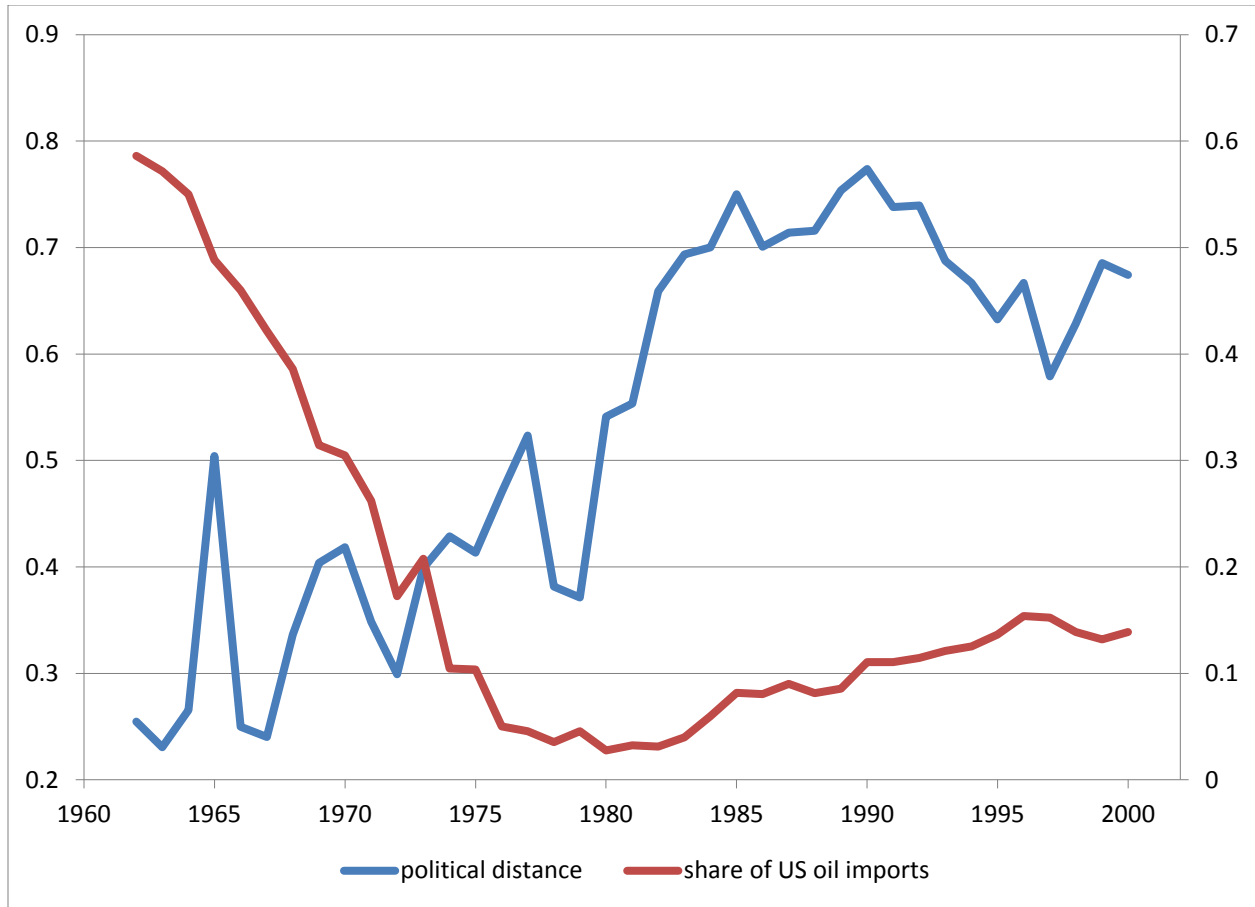


Figure 3
 Political Distance and US Oil Imports from Venezuela

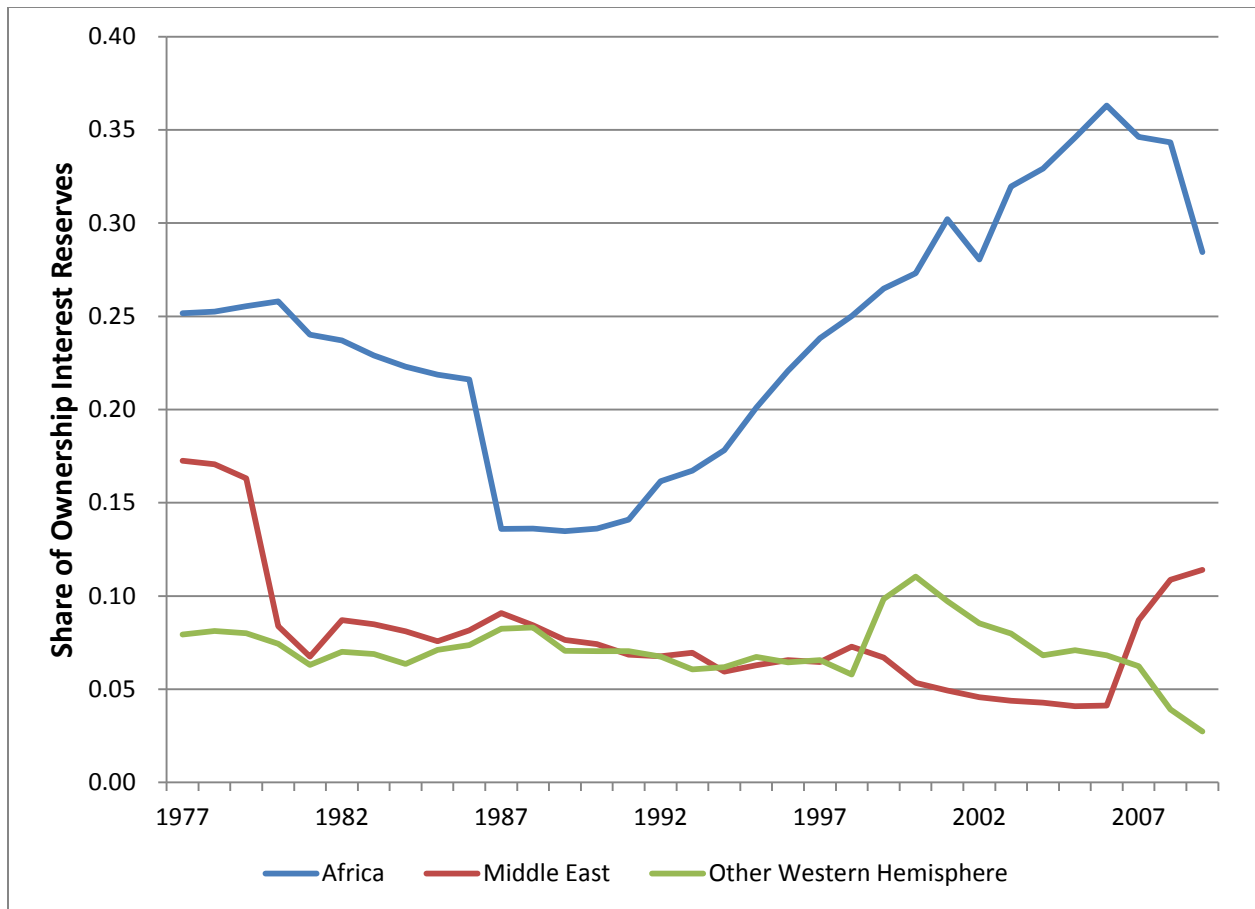


Figure 4
Time Series of Foreign Ownership Interest Reserves by Region