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The Effect of the Oil Trade Network on Political Stability

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THE EFFECT OF THE OIL TRADE NETWORK ON POLITICAL STABILITY

DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Arts and Sciences at the University of Kentucky

By
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ABSTRACT OF DISSERTATION

THE EFFECT OF THE OIL TRADE NETWORK ON POLITICAL STABILITY

My dissertation focuses on the impact of oil trade ties and network on political instability: democratization, civil war onset, and coups. Oil is an important resource to most states, while a few states, especially autocratic states, can produce and export it. This implies that the break of oil trade ties may strategically or economically damage oil-importing states more than oil-exporting states. In the three essays of my dissertation, I argue that oil trade ties allow oil-exporting states to resist to external pressures and encourage oil-importing states to support important oil exporters in order to avoid losing access to a much-needed commodity. In order to measure the effect of oil trade ties on three political instability problems, I employ centrality indices in weighted networks of network analysis. Based on the centrality indices, I measure the effect of oil-importing states on oil-exporters' abilities to resist international pressures and to obtain external support, and examine how an oil-exporting state's oil trade ties affect its three political instability phenomena: democratization, civil war onset, and coup risk. Empirical results reveal three ways in which an oil-exporting state's oil trade ties might affect its political instability; an autocratic oil-exporting state's oil trade ties reduce external democratizing pressures and hinder democratization; an oil-exporting state's oil trade ties attract external prewar support for its government, and reduce the likelihood of civil war onset when the exporter experiences external prewar support for its government; an oil-exporting state's oil trade ties reduce the likelihood of coup.

KEYWORDS: Oil Trade Network, Democratization, Prewar Intervention, Civil War Onset, Coup Risk

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THE EFFECT OF THE OIL TRADE NETWORK ON POLITICAL STABILITY

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1. Introduction

1.1 The Puzzle and Purpose

In 2012, the United States (U.S.) and the European Union (EU) imposed economic sanctions on Iran that included a phased ban on oil purchases designed to prevent Iran from pursuing its illicit nuclear program. However, because of its high level of reliance on Iranian oil, China—Iran’s largest oil customer—did not join U.S. and European antinuclear sanctions against Iran (Wines 2012). India even tried to exploit new economic opportunities in Iran created by the sanctions (Gladstone 2012).¹ However, in 1990, many states joined economic sanctions and the military coalition against Iraq to expel Iraqi troops from Kuwait, although Iraq was an important oil exporter in the international oil market. This reveals that although prior studies have focused primarily on the effect of oil on domestic actors, oil can also affect external actors’ decisions.

In addition, prior studies have rarely explain why each oil-producing state experiences different levels of political instability. For example, in 2010 many states in Middle East and Northern Africa (MENA) faced the revolutionary wave, including demonstrations and protests, riots, and civil wars, called the Arab Spring. Even the Libyan regime, which exported crude oil about 1.58 million barrel per day and was the fifteenth oil exporter in 2010, collapsed due to Western states’ military intervention in 2011. However, other states, such as Saudi Arabia, which exported crude oil at about 7.64 million barrel per day and was the top oil exporter in 2010, did not seen such instability, experiencing only minor protests that had little influence on the regime. Why did some oil-producing states in MENA face external pressures

¹ India’s crude oil imports from Iran had increased to 550,000 barrels a day in January 2012, partly offsetting a reduction by the sanction (Gladstone 2012).

and political instability problems, while other oil-producing states in MENA did not face them? What made the difference among oil-producing state in the same region?

Prior studies on political instability problems in MENA have primarily focused on how resource revenues and reserves, especially oil revenues and reserves, affect decisions of governments and opposition groups (e.g., Ross 2001; de Soysa 2002; Fearon and Laitin 2003; Smith 2004; Humphreys 2005; Lujala, Gleditsch, and Gilmore 2005; Ulfelder 2007; Ross 2009; Haber and Menaldo 2011; Wright, Frantz, and Geddes 2014). For example, studies on the effect of oil on democratization have argued that oil slows democratization and bolsters authoritarian regimes. As important financial sources of the regimes, oil revenues allow political leaders to be less concerned about public opinion, dampen grievances, and improve the coercive capabilities of the state (e.g., Ross 2001; Smith 2004). Studies on the effect of natural resources on the onset of civil war have argued that the exploitation of oil may increase the likelihood of violent rebellions by generating grievances among domestic groups (Ross 2004; Humphreys 2005), weakening state apparatuses that are required to manage domestic conflicts (Fearon and Laitin 2003), or improving the ability of leaders to mobilize rebels (Collier and Hoeffler 1998; Ross 2004; Humphreys 2005). However, these prior studies rarely explain why some oil-producing states (particularly in MENA) experienced regime collapse and civil war, while other states remain surprisingly stable. Likewise, as highlighted with the Iranian and Libyan cases above, little research explains how oil affects third parties' decisions to intervene in oil-producing states to influence their domestic politics.

The purpose of this project is to shed light on these puzzles by expanding prior studies in three ways. First, because prior studies have primarily focused on the effect of the existence of oil or oil revenues on political instability, they rarely explain the effect of oil on international factors of democratization, or suggest the effect of greedy third parties on civil war onset. Likewise, empirical results of prior studies have not consistently supported existing arguments. I argue that because the effect

of oil is more complicated than what prior studies have suggested, the empirical results are not consistent. Thus, I extend these studies by further specifying the effect of oil.

I classify the effect of oil into three categories: the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. Particularly, prior studies rarely focus on the effect of oil trade ties, although the effect of oil revenues and the effect of oil reserves on political stability are likely to be conditional on the effect of oil trade ties. The effect of oil trade ties is derived from two characteristics of oil in the international oil market: the value of oil as a primary energy source and the exporter-favored structure of the international oil trade market. That is, although most states need oil as a primary energy source, a few states can produce and export quality oil to other states. Thus, oil-importing states are likely to avoid the break of their oil trade ties because it is difficult to find alternative oil trade partners, and the break may significantly damage their economies. This implies that oil trade ties of an oil-exporting state can serve as either unintentional or intentional strategic tools to reduce international pressures and to attract external support for political stability. In Chapters 2-4, I highlight this argument, and specify how oil trade ties can affect three kinds of political instability phenomena: democratization, civil war onset, and coup risk.

Second, in order to measure the effect of oil on democratization and civil war, prior studies have primarily considered the amount of oil income per capita or a dichotomous variable to indicate an oil-exporting state (e.g., Ross 2001; de Soysa 2002; Fearon and Laitin 2003; Smith 2004; Humphreys 2005; Ulfelder 2007; Haber and Menaldo 2011; Ross 2013; Wright, Frantz, and Geddes 2014). However, as stated above, these measures likely underestimate or excessively simplify the effect of oil trade ties. In order to measure the effect of a state's oil trade ties, I classify it into three components: the depth of a state's oil trade ties, the breadth of a state's oil trade ties, and the closeness of a state's oil trade ties. The depth of a state's oil trade ties is the total oil amount for a state's oil trade ties, which captures the costs of

breaking an oil trade tie. The breadth of a state's oil trade ties is a state's number of oil trade partners, capturing the mechanism by which an oil exporter is able to resist external democratization pressures by using its oil trade ties as strategic tools. The closeness of oil trade ties is the level of a state's oil trade proximity to all other states, emphasizing the indirect role that oil trade ties can play. For example, in 2012 Russia did not export oil to Chile. Yet, Chile imported oil from the United Kingdom, which is one of Russia's oil importers. Although Chile does not have a direct oil trade tie with Russia, the break of the oil trade tie between United Kingdom and Russia can affect the United Kingdom's oil reserves and, ultimately, its oil exports to other countries, including Chile. In order to simultaneously examine the effect of these three components on political stability, I define the combination of three components of a state's oil trade ties as the "influence" of oil trade ties on the entire oil trade market, and employ closeness centrality in weighted networks of social network analysis. The closeness centrality in weighted networks allows us to more accurately examine the effect of a state's oil trade ties on political stability.

Third, in this project I specify and examine how oil affects political stability with three political instability problems: democratization, civil war onset, and coup risk. However, although numerous prior studies on oil and political stability have dealt with the effect of oil on democratization and civil war onset, they have rarely focused on coups d'état, which have been understood as the result of political instability (Marinov and Goemans 2013). *Coup d'état* is defined as "illegal and overt attempts by the military or other elites within the state apparatus to unseat the sitting executive" (Powell and Thyne 2011). A study on the relationship between oil and coup risk can suggest another causal relation: how oil affects political instability. In addition, because a *coup d'état* is an illegal attempt that weakens political stability, this study can also shed light on how oil affects not only legal but also illegal attempts that weaken the political stability of oil-producing regimes. I examine the relationship between oil and coup risk in Chapter 4.

In the remainder of this chapter, I review the literature that incorporates the effect of oil on democratization, civil war onset and coups d'état. In this part, I highlight that prior studies on democratization and civil war have suggested contrasting arguments about the effect of oil on political stability. I argue that these contrasting arguments come about because scholars have focused primarily on the domestic effect of oil, but rarely consider the international effect of oil. Based on this review, I suggest how the effect of oil should be better specified and why we should focus on the effect of an oil-producing state's oil trade ties. In addition, I explain how we can measure the effect of an oil-producing state's oil trade ties. Finally, I provide a preview to the theoretical argument, empirical tests, and policy implications that are developed in the pages to come.

1.2 How Does Oil Affect Political Instability in an Oil-Producing State?

A large literature in political science has argued that oil helps perpetuate autocratic regimes and increases the likelihood of civil war onset, which is commonly referred to as the “oil curse” (e.g., Chaudhry 1989; Karl 1997; Ross 2001; Wantchekon 2002; Fearon and Laitin 2003; Smith 2004; Humphreys 2005; Ulfelder 2007; Morrison 2009; Ross 2009; Basedau and Lay 2009; Aslaksen 2010; Cuaresma, Oberhofer, and Raschky 2011; Andersen and Aslaksen 2013; Wright, Frantz, and Geddes 2014). However, the majority of prior studies has focused on how oil influences internal factors of democratization or the onset of civil war.

First, a large body of prior studies on the relationship between oil and democratization have focused on the effect of oil revenues, commonly referred to as the “rentier state” effect. The rentier effect theory is that political leaders or regimes that do not rely on domestic extraction (i.e., taxes) for the bulk of their revenue are more likely to be autocratic (Najmabadi 1987). When oil is the main fiscal source, the

government becomes a distributive state rather than an extractive state because of the exceptional size of oil revenues (Delacroix 1980). Because oil, as a state-owned asset, is likely to radically increase government finances, oil-rich governments do not have to be concerned with societal interests to extract their operating revenues. This is referred to as the “taxation effect” (Skocpol 1982; Najmabadi 1987; Vandewalle 1998; Ross 2001). Oil revenues also allow for more social spending in dictatorships, which lowers social grievances and dampens latent democratizing pressures, called the “spending effect” (Entelis 1976; Kessler 1999). However, because world oil prices are volatile, government finances depending on oil revenues are likely to be unstable (Ross 2013). If an oil-funded government makes information about oil revenues known to the public, political leaders’ incompetence might be discovered. This implies that the information about oil revenues might reduce the survivability of political leaders. However, information about oil revenues is easily concealed because the oil industry is managed by the relationship between host governments and foreign oil companies or by state-owned oil companies. In autocratic states, we do not see institutions that force the government to make information about oil revenues known to the public, making it easy for political leaders to conceal this information. In this process, political leaders can satisfy their greed. Political leaders in oil-funded governments have a strong incentive to remain autocratic, enabling them to maintain power and hide their incompetence and greed from the public. Therefore, oil is likely to hinder democratization.

However, empirical results in prior studies on oil democratization have not been consistent. For example, Dunning (2008) argued that Latin America is less likely to be affected by antidemocratic impacts of oil revenues. Oil-producing states in Latin America, including Venezuela, Bolivia, Argentina, Mexico, and Ecuador, are now democracies. The Latin American exception says that the rentier effect theory does not explain all cases about the relationship between oil and democratization. Haber and Menaldo (2011) argued that oil does not promote autocratic regimes over the long run. Their empirical

results suggested that oil is likely to increase the level of democracy as a resource blessing.

Second, most prior studies on the onset of civil war have focused on natural resources rather than oil itself, and have suggested three mechanisms that show how oil and other resources influence either governments or rebels. First, some scholars have emphasized influences of natural resource revenues on state apparatuses (e.g., Chaudhry 1989; Humphreys 2005; Karl 1997; Ross 2001; Wantchekon 2002; Fearon and Laitin 2003). They have argued that political leaders in a state whose budget depends primarily on natural resource revenues tend to have weaker state apparatuses because they rely less on “a socially intrusive and elaborate bureaucratic system” to raise tax revenues (the weak states mechanism) (Fearon and Laitin 2003, 81). In other words, natural resource revenues allow governments to rely less on state-society linkages and to be less responsive to their citizens (Beblawi and Luciani 1987).

Second, part of the literature has focused on the effect of natural resources on the rebel’s side. Arguments are generally classified into two mechanisms: the grievance mechanism and the greedy rebel mechanism. The grievance mechanism argues that resource extraction may generate grievances among the local population, which provides the fuel for rebel mobilization through forced migration (Ross 2004; Humphreys 2005). For example, logging or mining firms may expropriate land from people, deprive them of any benefits from the land, or cause environment damages, such as the extraction process in Ache and Papua New Guinea (Gedicks 2001; Klare 2001; Switzer 2001). Labor migration in these processes causes insufficient job opportunities in the region, social disruptions, and unjust resource wealth distribution, such as in Sierra Leone, Nigeria, Niger, and Chad (Humphreys 2005). Also, the vulnerability of economies depending on natural resource revenues to trade shocks and wealth redistribution might generate grievances. These grievances then facilitate rebel mobilization.

The greedy rebel mechanism argues that natural resources are financial sources that allow rebel leaders to mobilize and organize to challenge government forces (Collier and Hoeffler 2004; Ross 2004; Humphreys 2005). Rebel leaders raise money both by selling natural resources and selling “booty futures” (Humphreys 2005; Ross 2005). That is, rebels in resource-producing regions more easily fund the start-up costs of initiating a rebellion (Collier and Hoeffler 2004; Ross 2004). In addition, if a natural resource is concentrated in a particular region in a state, the local population in the region may believe that a seceding state is viable and even prosperous (Ross 2003). This implies that natural resources increase the economic value of capturing the state or seceding.

However, despite these arguments, empirical results in prior studies have not clearly and consistently revealed that natural resources increase the likelihood of civil war onset. While Collier and Hoeffler (1998, 2004, 2006) and Hegre (2002) showed that higher natural resource revenues are likely to cause civil war outbreak using the ratio of primary exports to GDP, Elbadawi and Sambanis (2002) revealed weak or no effect of natural resource revenues with the same measurement. In order to clarify their effect on onset of civil war, Snyder and Bhavnani (2005) and Lujala et al. (2005) classified natural resources into two concepts: lootable (resources that have low economic barriers to entry and can be profitably exploited by small-scale artisans), such as secondary diamonds, and non-lootable (resources that require large amounts of capital and technology to exploit), such as oil. The high entry barrier of non-lootable resources allows the government to establish monopoly control over them. However, lootable resources are likely to be mined by other types of domestic actors, such as rebels or illegal miners, because of the low-level entry barrier. The difference between lootable and non-lootable resources implies that lootable resources may provide opportunities that rebel leaders use to mobilize rebels as financial sources, although non-lootable resources rarely influence rebel mobilization. Their empirical results supported this argument, revealing that lootable resources increase the likelihood of civil war onset, while

non-lootable resources reduce it. However, they do little explain why non-lootable resources, including oil, may reduce the likelihood of civil war.

Finally, although a large literature on the oil curse theory has focused on democratization and onset of civil war, scholars have rarely dealt with *coups d'état*. Generally, *coups d'état* as an illegal attempt have been understood as the result of political instability (Marinov and Goemans 2013). This implies that if oil may affect a state's political stability, oil should affect coup risk as well as democratization and civil war onset.

1.3 Oil Trade Ties, External Actors and Political Stability

Most oil-producing states obtain oil revenues from oil exports to other states. However, their oil trade ties might be their intentional or unintentional strategic tools to reduce international pressures or to attract external support. This is due to two characteristics of the international oil trade market: its exporter-favored structure and the importance of oil as a primary energy source. First, in the international oil trade market, although most states in the world try to import oil, few states can produce and export quality oil. For example, in 2010, although 210 states in the world consumed oil at least one thousand barrel per day, only 115 states could produce oil at least one thousand barrel per day.² In 2010, for example, only five states produced 50 percent of the total world oil supply. This implies that many states depend on oil imports and a few main oil producers significantly affect the international oil trade market. Second, in most states, oil is a primary energy source. In 2010, the oil energy consumption of the world was 42 percent of the total energy consumption (International Energy Agency 2014a). This implies that

² All data come from U.S. Energy Information Administration (<http://www.eia.gov/countries/data.cfm#undefined>).

stable oil supply is an important factor of the world's economy. These two characteristics of the international oil trade market imply that oil-importing states have few alternative oil-exporting states, compared to oil-exporting states, and the break of the importers' oil trade ties may cause higher costs to the oil-importing states compared to oil-exporting states. In order to avoid the costs from the break of an oil trade tie, oil-importing states are apt to support the political stability of oil-exporting states, and are less likely to impose pressures on oil-exporting states because of policy conflict derived from the expected costs of the break of their oil trade ties.

In order to specify the effect of an oil-exporting state's oil trade ties on external actors and its political stability, I decompose the effect of oil trade ties into three components: *depth*, *breadth*, and *closeness*.³ The depth of oil trade ties captures the costs of breaking an oil trade ties. When the expected economic costs generated by an oil-importing state's policy decision to give pressures to an oil-exporting state are higher than the expected political benefits of the policy decision, we would expect little pressure. In other words, even if an oil-exporting state exports oil to many other powers, if the oil-exporting state does not export a substantial amount of oil to them, its oil trade ties would not create policy conflict in the oil-exporting state.

The breadth of oil trade ties is a state's number of oil trade partners. This captures the mechanism by which an oil-exporting state can resist external pressures and attract external support by using its oil trade ties as strategic tools. As the oil exporter exports oil to more states, more external actors are likely to experience policy conflict generated by the expected costs from the break of its oil trade ties, and are sensitive to political stability of the oil-exporting state. This implies that the exporter is more

³ These three components (breadth, depth, and closeness) are similar to Kinne's (2012) measures for trade integration. Instead of capturing these general trade patterns, however, I use these measures to capture an exporter's ability to resist external pressures and attract external support due to the export-favored structure of the oil market and the importance of oil as a primary energy source.

likely to experience weaker external pressures and obtain external support from more states. This should increase the level of the exporter's political stability.

The closeness of oil trade ties captures the level of a state's oil trade proximity to all other states, including states that it does not trade oil with directly. This emphasizes the indirect role that oil trade ties can play in external actors' policy decisions and an oil-exporting state's political stability. Thus, if oil trade ties of an oil-exporting state can directly or indirectly affect more states in the international oil trade market, the oil-exporting state can generate policy conflict in more states and make more states support the exporter. This might help political stability of the oil exporter. In this project, the effect of an oil-exporting state's oil trade ties on political stability is measured by the combination of these three components. I will more specifically explain these three components of oil trade ties with technical terms in Chapter 2.

1.4 What to Expect

This project is divided into three main sections. In Chapter 2, I develop a theory of how an autocratic oil-exporting state's oil trade ties affect the likelihood of democratization. I highlight that although prior studies have argued that external pressures are important determinants of democratization, few have focused on how oil affects these external pressures. I argue that oil trade ties with democratic oil importers allow autocratic oil exporters to resist external pressures and, ultimately, hinder democratization. This is because the economic and strategic importance of oil and the limited number of oil exporters increase the potential costs of breaking oil trade ties among democratic oil importers, limiting their abilities spread democracy. In order to analyze this, I classify external democratizing pressures into two groups: direct forces from democratic great powers and indirect transplantation. Direct

forces from democratic great powers are military, economic, or diplomatic interventions of democratic great powers that are meant to liberalize institutions of an autocratic regime. For example, Western states tried to force Kenya and Mozambique to liberalize, and to block stolen elections in Serbia and Ukraine (Levitsky and Way 2010). Also, Western states have tried to punish political abuse of autocratic states by imposing economic sanctions and reducing foreign aid, or through diplomatic pressures like United Nations resolutions (Levitsky and Way 2010). Indirect transplantation focuses on the process by which citizens in autocratic regimes learn and become familiar with democratic norms and institutions via political, economic, and social ties. For example, citizens in autocratic regimes can “learn” democracy when they watch Western movies or work with people from democratic states. Also, international cooperation in democratic-led alliances, treaties, and international organizations provide opportunities for political leaders, officers, or soldiers to experience democratic systems. These processes may strengthen domestic democratizing pressures as more citizens in autocratic regimes are educated about democratic systems (Sanborn and Thyne 2014).

An autocratic oil-exporting state’s oil trade ties are likely to reduce direct forces from democratic great powers. There are two reasons. First, the economic costs of democratic great powers’ policies to democratize autocratic oil exporters are generally high because of the international oil trade market structure and the importance of oil. If the democratic great powers’ policies to democratize autocratic oil exporters cause political instability problems that can cause the decrease in oil-producing and oil-exporting, the democratic great powers should bear both costs of the policies to democratize and economic costs from the break of the autocratic oil exporters’ oil trade ties. In addition, Organization of Petroleum Exporting Countries (OPEC) founded by autocratic oil-producing states to unify and coordinate their oil policies, the trend that autocratic oil-producing states try to nationalize their oil industries, and the difficulty to increase the amount of oil production or decrease oil consumption in the

short term are likely to increase costs from the break of oil trade ties in the international oil trade market. The expected high costs from the break of oil trade ties may discourage democratic great powers to try to liberalize autocratic oil-exporting states.

Second, oil trade ties of an autocratic oil-exporting state reduce the political costs that would otherwise be incurred due to external democratization pressures. Generally, external pressures like economic sanctions will work only if they generate substantial political costs for the leaders of target states, such as the loss of political power following the pressure (Marinov 2005). Although most pressures may generate political costs in the short term, the costs generally decrease in the long term because of adjustment of political and economic structures (Dizaji and van Bergeijk 2013). Furthermore, because of the structure of the international oil trade market, autocratic oil-exporting states can easily find alternative oil-importing states, primarily non-democratic countries with big economies, and the new oil trade ties can compensate for the loss from democratic great powers' pressures in the long term. In sum, oil trade ties of autocratic oil exporters are apt to deflate the effect of direct democratization pressures.

In addition, oil trade ties, not like other kinds of trade ties, are less likely to be a path of democratic norms and cultures due to two unique characteristics of the oil market. First, oil exploration and production rely primarily on capital needed for expensive equipment and technologies of high-income states rather than labor forces (Yergin 1991). This implies that oil trade ties allow a limited number of people to be involved in the oil trade process, which lessens the likelihood that this type of trade will allow people in non-democratic states to experience democratic norms and institutions. Second, unlike other kinds of manufacturing industries, oil industries are less likely to facilitate the development of other local industries (Ross 2013). Manufacturing industries generally buy goods from other companies to produce their products, and these activities facilitate the development of other industries. However, because oil industries rely on expensive equipment that tends to be produced in high-income

states, oil industries rarely affect other industries, and are less likely to produce paths of democratic norms and institutions. Therefore, oil industries of autocratic regimes tend to produce less and restrain paths by which citizens learn about democracy. In sum, because oil trade ties of an autocratic oil-exporting state are likely to reduce two kinds of external democratizing pressures, direct forces from democratic great powers and indirect transplantation, oil trade ties of an autocratic oil-exporting state may hinder democratization.

In Chapter 3, I suggest that an oil-exporting state's oil trade ties attract external support for the government side to prevent the onset of civil war. Prior studies on the relationship between oil and the onset of civil war argue that oil increases the likelihood of civil war by either improving rebel leaders' financial capability to mobilize or by weakening state apparatuses. However, it is not clear why some states have not experienced civil wars despite the effect of oil. This chapter advances a theory of oil trade ties, prewar intervention, and civil war onset. Because of the importance of oil and the structure of the international oil trade market, the costs of breaking an oil trade tie are greater for oil importers vis-à-vis oil exporters. This gives oil exporters leverage over oil importers, which encourages the latter to support oil exporters who have political instability problems. This is because the onset of civil conflict in exporting states threatens oil trade ties, and oil importers can expect to bear significant costs for such a break. Given this, I hypothesize that oil trade ties will increase the likelihood of prewar intervention in exporting states to support the government.

In addition, I argue that although third parties try to support for the government side of an oil-exporting state prior to the onset of civil war, this does not mean that prewar intervention generated by an oil-exporting state's oil trade ties reduce the likelihood of civil war onset. This is because war is costly (Fearon 1995), and the government side and the rebel side of the oil-exporting state try to avoid civil war onset by finding a mutually-agreeable bargaining point regardless of the distribution of power between

them. Thus, when preferences of third parties are obvious (i.e., presented via costly signals), interveners change the range of the bargaining area between both sides, but do not affect the likelihood of civil war onset (Cetinyan 2002; Thyne 2009). However, oil trade ties can cause two information problems that can make disagreement over the likely outcome of war and make civil war a rational option (Walter 2009). First, oil-exporting states, especially autocratic oil-exporting states, try to conceal information about oil wealth from the public (Ross 2013). If the public knows the information about oil wealth, it may engender grievances about the unequal distribution of oil wealth or the government's incompetence related with oil industry management. However, oil-exporting states more easily collude to conceal their transactions of their oil industries and to hide both their revenues and expenditures because oil industries are generally managed by national oil companies or by the relationship between governments and international oil companies. This implies that rebels are less likely to have complete information about their government's oil industries and, thus, the likelihood of external support for the government caused by its oil trade ties. If the rebel side underestimates the likelihood of external support for the government caused by its oil trade ties because of incomplete information, it would be difficult to find a mutually-agreeable bargaining point.

Second, even if the rebel side of an oil-exporting state has perfect information about the exporter's oil wealth, the exporter's oil trade ties might cause the outbreak of civil war. Generally, a decision of a third party to intervene depends on intervention costs and expected benefits from the intervention. Although costs of prewar intervention are generally lower than costs of intervention in ongoing civil war, as strategic actors third parties choose prewar intervention when expected payoffs of the prewar intervention can be maximized. This implies that oil trade ties might not be credible signals from external actors. That is, although the break of an oil trade tie is likely to generate higher costs to an oil-importing state and, thus, the oil importer tries to avoid the break, the oil trade tie would not be a

credible signal from the importer to the exporter if the oil importer has numerous alternative oil trade partners, relies less on the oil trade tie with the oil exporter, or oil itself than other energy sources. Also, because this information is usually private information of the oil importer, an oil-exporting state's government and rebel sides might miscalculate the likelihood of oil-importing states' support for the government side. In sum, if the rebel side of an oil-importing state has little information about its government side's oil trade ties or both sides differently expect the likelihood of its trade partners' support for the government side generated by the oil trade ties (especially if the rebel side underestimates the likelihood of the external support for the government side), oil trade ties, as less credible signals, might cause information problems and failure to find a mutually-agreeable bargaining point.

However, support for the government side from an oil-importing state can make its oil trade ties serve as credible signals. If an oil-importing state already supports the government side of an oil-exporting state to resolve the exporter's political instability problem, the exporter's government and rebel sides would be certain that the oil importer expects that exit costs of its oil trade tie with the exporter are higher than costs of support for the government side.

Chapter 4 suggests that, in order to avoid economic costs generated by the break of oil trade ties, oil-importing states are likely to be concerned about domestic politics of an oil-exporting state and give supportive signals to its government. These supportive signals to the government of an oil-exporting state are likely to reduce coup plotters' expected probability of a coup success and their disposition to intervene with the possibility that oil-importing states can intervene to overthrow the new government established by a coup to stabilize domestic politics of the oil-exporting state and their oil trade ties. Thus, an oil-exporting state's oil trade ties are likely to reduce the likelihood of coup.

In addition, the effect of an oil-exporting state's oil trade ties on coup risk interacts with the

effect of oil reserves on coup risk. Specifically, I argue that the effect of oil reserves can be reduced by oil trade ties. One of causal explanations for the effect of oil reserves on coup risk is that third parties, who do not import oil from an oil-exporting state, are likely to intervene in domestic politics of the oil exporter to benefit from its oil reserves. However, if a state exports oil to numerous states and is an important exporter in the international oil trade market, third party intervention in domestic politics of the state to benefit from its oil reserves would be deterred by its oil trade partners, who want to protect their current benefits from their oil trade ties with the exporter. This implies that the increase in the effect of a state's oil trade ties in the international oil trade market is likely to make more defenders who protect the state from greedy third party intervention and, thus, decreases coup risk by reducing the likelihood of hostile signals to the government of the state.

In the final chapter, I conclude the analytical part of this project, and suggest academic and policy implications. First, I highlight that the effect of oil on political stability phenomena, including democratization, civil war, and a coup d'état, is more complicated than what prior studies on democratization and civil war have dealt with. Especially, oil significantly affects international factors of political stability. The exporter-favored structure of the international oil trade market and the importance of oil make the break of an oil trade generate more costs to an oil-importing state than to an oil-exporting state. This characteristic of an oil trade tie allows an oil-exporting state to use its oil trade ties as strategic tool to reduce international pressures and attract external support.

Second, this project implies that the effect of trade ties on conflict might be more complicated. In a large literature, some prior studies have argued that trade ties lead to a more peaceful world (Gartzke, Li, and Boehmer 2001; Polachek 1997; Russett and Oneal 2001), although a contradictory body of research has suggested that trade ties generate more conflictual behavior between states (Barbieri 1996). Although Crescenzi (2003) argued the relationship between economic interdependence and conflict is

conditional both on the ability of states to alter or forgo their economic ties and the issues at stake in their political discourse, he measured exit costs with trade share and price elasticity. However, this project suggests that what products a state export to and/or import from other states is also important to determine exit costs. As I argued above, the structure of the international oil market and the importance of oil increase the ability to an oil-exporting state to resist international pressures and attract external support. However, if a state exports strategically less important products, such as toys, to other states, the state would not obtain any ability from its trade ties. This implies that, in order to analyze the effect of economic interdependence on conflict, we should focus on more specific trade ties that a state has and the effect of economic interdependence is more complicated than prior studies have dealt with.

Third, this project reveals that energy policies are related to international relations. The ability of an oil-exporting state to resist international pressures and attract external support is derived from the exporter-favored structure of the international oil market and the importance of oil as a primary energy source. This implies that the decrease in the world's energy reliance on oil is likely to reduce an autocratic oil-exporting state's ability to stabilize its domestic politics and hinder democratization. That is, renewable energy development policies help not only to reduce environmental problems, but to also facilitate democratization in autocratic oil-exporting states, especially states in Middle East and North Africa.

2. The Oil Trade Network and Democratization

2.1 The Puzzle and Purpose

A large literature in political science argues that oil revenues help perpetuate autocratic regimes (e.g., Ross 2001; Smith 2004; Ulfelder 2007; Morrison 2009; Ross 2009; Basedau and Lay 2009; Aslaksen 2010; Cuaresma, Oberhofer, and Raschky 2011; Andersen and Aslaksen 2013; Wright, Frantz, and Geddes 2014). These studies have primarily suggested the rentier effect that oil revenues allow political leaders to be less concerned with societal interests by reducing their reliance on taxes (Skocpol 1982; Najmabadi 1987; Vandewalle 1998) and allow for more social spending to lower social grievances and dampen latent democratizing pressures (Entelis 1976; Kessler 1999). That is, these studies focus primarily on how oil influences *domestic* democratizing pressures. However, especially in the post-Cold War period, scholars have recognized that *external* pressure plays a prominent role in democratization trends (Huntington 1990; Linz and Stepan 1996; Gleditsch and Ward 2006; Levitsky and Way 2010; Boix 2011). This implies that a deeper understanding of the relationship between oil and external democratizing pressures is warranted.

In order to analyze influences of oil on external democratizing pressures, I focus on oil trade ties of autocracies. I argue that autocratic oil-exporting states may intentionally or unintentionally use their oil trade ties as strategic tools. This is due to the exporter-favored international oil market structure, where most states in the world need oil, but only a few states can export it. Because many of the largest oil exporters are autocratic regimes while most of the world's oil importers are democracies, understanding influences of autocratic regimes' oil trade ties can help explain how some states resist external democratization pressures. For example, in 2012 the United States (U.S.) and the European Union (EU)

imposed economic sanctions on Iran that included a phased ban on oil purchases designed to prevent Iran from pursuing its illicit nuclear program. However, because of its high level of reliance on Iranian oil, China—Iran’s largest oil customer—did not join the U.S. and European antinuclear sanctions against Iran (Wines 2012). India even tried to exploit new economic opportunities in Iran created by the sanctions (Gladstone 2012). This case shows that dependence on a state’s oil may reduce the success of external pressures to influence its domestic policies.

The main purpose of this research is to move beyond the rentier effect in suggesting another mechanism that explains the relationship between oil and regime types. In order to measure the influence of oil trade relations on external democratizing pressures, I employ a social network approach, focusing on the concept of network centrality. In network research, centrality indices indicate the level of each state’s influence on the international oil trade network and each state’s ability to reduce external pressures. The centrality indices capture three components of oil trade ties: the depth of oil trade ties (the total oil amount for a state’s oil trade ties), the breadth of states’ oil trade ties (a state’s number of oil trade partners), and the closeness of oil trade ties (the level of a state’s oil trade proximity to all other states). Each component specifies how oil trade ties hinder democratization. The main findings support the idea that oil hinders democracy by reducing both domestic and external democratizing pressures.

The remainder of this paper is organized as follows. In the first section, a brief review of the literature on oil and democracy reveals that previous studies have focused predominantly on how oil influences democratization of exporter states internally, paying little attention to the way autocratic oil-exporting states have been able to resist external democratizing pressures from the West. In the second section, I develop a theoretical framework to study the relationship between external democratizing pressures and oil trade ties. The third section explains the oil trade network, and examines how oil trade ties of autocratic exporters hinder democratization. In the final section, I discuss the implications and

limitation of the results.

2.2 The Rentier State Effect and Democratization

A large body of prior studies works on the relationship between oil and democratization has focused on the effect of oil revenues, called as the rentier state effect.⁴ The rentier effect theory argues that political leaders or regimes that do not rely on domestic extraction (i.e., taxes) for the bulk of their revenue are more likely to be autocratic (Najmabadi 1987). When oil is main revenue sources, the government would be a distributive state rather than an extractive state because of the exceptional size of oil revenues from state assets (Delacroix 1980). Because oil radically increases government finances, oil-rich governments do not have to be concerned with societal interests to extract their operating revenues. This is referred to as the “taxation effect” (Skocpol 1982; Najmabadi 1987; Vandewalle 1998; Ross 2001). Oil revenues also allow for more social spending in dictatorships, which lowers social grievances and dampens latent democratizing pressures, called as the “spending effect” (Entelis 1976; Kessler 1999). However, because world oil prices are volatile, government finances depending on oil revenues are likely to be unstable (Ross 2013). If governments make information about oil revenues known to the public, therefore, political leaders’ incompetence might be discovered. However, information about oil revenues is easily concealed because the oil industry is managed by the relationship between host governments and foreign oil companies or by state-owned oil companies. In autocratic states, we do not see institutions that force the government to make information about oil revenues known to the public, making it easy for political leaders to conceal this information. In this process, political leaders can satisfy their greed. This implies that political leaders in oil-funded governments have a strong incentive to remain autocratic, enabling

⁴ Ross (2001) suggested three mechanisms that oil hinders democracy: rentier effect, repression effect, and modernization effect. However, recent studies have argued that empirical results do not support repression and modernization mechanisms (e.g., Ross 2009). Thus, I discuss only the rentier state effect in this part as a main mechanism of how oil influences domestic democratizing pressures.

them to maintain power and hide their incompetence and greed from the public.

However, some prior studies have suggested that oil revenues do not have significant influences on democracy. For example, Dunning (2008) argued that Latin America is less likely to be affected by antidemocratic impacts of oil revenues. Oil-producing states in Latin America, including Venezuela, Bolivia, Argentina, Mexico, and Ecuador, are now democracies. The Latin American exception says that the rentier effect theory does not explain all cases about the relationship between oil and democratization. Haber and Menaldo (2011) argued that oil does not promote autocratic regimes over the long run. Their empirical results suggested that oil is likely to increase the level of democracy as a resource blessing.

I argue that the reason empirical results of some prior studies do not support the oil-curse theory is that prior studies on the relationship oil and democracy have provided an insufficient focus on external democratizing pressures. A large number of studies, especially in the post-Cold War period, show that democratic transition process is affected by both domestic and external democratizing pressure (e.g., Linz and Stepan 1996; Gleditsch and Ward 2006). In order to examine influences of oil on democracy more thoroughly, therefore, its influence on external democratizing pressures should be considered. In the next part, I review past work on external democratizing pressures, and explain how oil may reduce these pressures.

2.3 External Democratizing Pressures

The worldwide democratization phenomena after the Cold War compelled scholars to focus on the international dimension of democratization.⁵ The external forces of democratization come from the

⁵ See Huntington (1990), Linz and Stepan (1996), Gleditsch (2002), Levitsky and Way (2010), and Boix (2011).

intervention of democratic great powers in the domestic politics of small states (Boix 2011), or political, economic, or social interactions with democracies (Levitsky and Way 2010). Prior studies have argued that external forces explain why the proportion of democracies rose to two-thirds in the post-Cold War era, and why external democratizing pressures should be considered in studies of democracy (e.g., Gleditsch and Ward 2006; Boix 2011).

Generally, external democratizing pressures can be classified into two forces: direct forces and indirect transplantation.⁶ First, direct forces are military, economic, or diplomatic interventions of democratic great powers that are meant to liberalize institutions of an autocratic regime. For example, Western states tried to force Kenya and Mozambique to liberalize, and to block stolen elections in Serbia and Ukraine (Levitsky and Way 2010). Also, Western states have tried to punish political abuse of autocratic states by imposing economic sanctions and reducing foreign aid or through diplomatic pressures like United Nations resolutions (Levitsky and Way 2010). Second, indirect transplantation focuses on the process by which citizens in autocratic regimes learn and become familiar with democratic norms and institutions via political, economic, and social ties. For example, citizens in autocratic regimes can “learn” democracy when they watch Western movies or work with people from democratic states. Also, international cooperation in democratic-led alliances, treaties, and international organizations provide opportunities for political leaders, officers, or soldiers to experience democratic systems. These processes may strengthen domestic democratizing pressures as more citizens in autocratic regimes are educated about democratic systems (Sanborn and Thyne 2014).

⁶ This classification is based on Levitsky and Way’s (2010) characterization of external democratizing pressures. They classified these pressures as Western leverage (autocratic regimes’ ability to avoid Western action to punish abuse or encourage them to liberalize political institutions) and Western linkage (the interdependent networks that connect individual polities, economies, and societies to Western democratic communities). However, their research focuses on competitive authoritarianism. In order to avoid possible confusions about this, I use the terms “direct forces” and “indirect transplantation.”

2.4 The Impact of Oil on External Democratizing Pressures

In order to analyze impacts of oil on the two types of external democratizing pressures, I focus on both oil trade ties and the characteristics of oil industries. I argue that oil trade ties of autocratic oil-exporting states reduce direct forces from democratic great powers, while characteristics of oil industries hinder the ability of oil trade ties to function as indirect transplantation paths of democratic norms and institutions.

2.4.1 Oil and Direct Forces from Democratic Great Powers

Oil trade ties of an autocratic oil exporter may hinder the policy decisions of democratic great powers by creating conflict between the great powers' economic and foreign policy goals. This is due to two main reasons. First, the economic costs of democratic great powers' policies to democratize autocratic oil exporters are generally high because of the international oil trade market structure and the inelasticity of oil prices. In most states, oil is a primary energy source. For example, the oil fuel share of total final energy consumption in 2012 was 40.7 percent (International Energy Agency 2014b). However, in the international oil trade market, only a few states can produce and export a large amount of quality oil to other states. Thus, we see many alternative oil importers in the oil trade market, but few alternative exporters. This implies that costs from the break of oil trade ties are higher to oil-importing states than to oil-exporting states. For example, when oil trade ties of an autocratic oil exporter with democratic great powers are broken, non-democratic oil importers like China can be alternative trade partners. However, it is much more difficult for democratic oil importers to find an alternative oil exporter in the international oil market. Compounding this, important autocratic oil-exporting states founded Organization of Petroleum Exporting Countries (OPEC) to unify and coordinate their oil policies, and nationalized oil industries. These policies allowed them to substantially impact the international oil market. Finally, oil

prices are inelastic because it is difficult to increase the amount of oil production or decrease oil consumption in the short term. If the ability of an oil-exporting state to produce and export oil decreases because of pressures from democratic great powers, the great powers will likely bear high economic costs incurred by the skyrocketing international oil price. For example, in 1979 the decreased ability of Iran to produce oil generated by Iranian Revolution increased the price of crude oil from 15.85 to 39.50 dollars per barrel (British Petroleum 2014).

Second, oil trade ties of an autocratic oil-exporting state reduce the political costs that would otherwise be incurred due to external democratization pressures. Generally, external pressures like economic sanctions will work only if they generate substantial political costs for the leaders of target states, such as the loss of political power following the pressure (Marinov 2005). Although most pressures may generate political costs in the short term, the costs generally decrease in the long term because of adjustment of political and economic structures (Dizaji and van Bergeijk 2013). Furthermore, because of the structure of the international oil trade market, autocratic oil-exporting states can easily find alternative oil-importing states, primarily non-democratic countries with big economies, and the new oil trade ties can compensate for the loss from democratic great powers' pressures in the long term. For example, even if an autocratic oil-exporting state suffers from economic sanctions, revenues from the alternative oil trade ties allow that its government can invest money in domestic markets to change its economic structure to reduce losses from the sanctions and stabilize political status of its leaders.

In sum, oil trade ties of autocratic oil exporters are apt to deflate the effect of direct democratization pressures in two ways. First, by increasing economic costs that democratic great powers bear when they enact policies to democratize autocratic oil exporters, autocratic oil exporters should see less external pressure to democratize in the first place. Second, oil allows autocratic exporters to reduce political costs generated by external democratizing pressures. These forces thereby reduce the first main

external democratizing mechanism: direct forces from democratic great powers.

2.4.2 Oil and Indirect Transplantation

Trade ties of autocratic regimes with democratic states serve as paths by which democratic norms and cultures are transmitted (Levitsky and Way 2010). International trade processes allow citizens in autocratic regimes to meet people from democratic states, experience democratic norms and cultures via communication with them, and, sometimes, to become familiarized with democratic institutions. These processes may provide the basis of domestic democratizing pressures by educating citizens in autocratic regimes about democracy (Sanborn and Thyne 2014). However, oil trade ties are less likely to be a path of democratic norms and cultures due to two unique characteristics of the oil market.

First, oil exploration and production rely primarily on capital needed for expensive equipment and technologies of high-income states rather than labor forces (Yergin 1991). This implies that oil trade ties allow a limited number of people to be involved in the oil trade process, which lessens the likelihood that this type of trade will allow people in non-democratic states to experience democratic norms and institutions. Second, unlike other kinds of manufacturing industries, oil industries are less likely to facilitate the development of other local industries (Ross 2013). Manufacturing industries generally buy goods from other companies to produce their products, and these activities facilitate the development of other industries. For example, because car or air industries require many parts to produce their final products, they are likely to develop industries of car or aircraft parts. In addition, because those industries are labor-intensive industries and, thus, generally hire many people who can be service consumers, the industries are also likely to develop service industries. This process allows more citizens to be involved in production processes and broadens international trade processes. However, because oil industries rely on expensive equipment that tends to be produced in high-income states, oil industries rarely affect other

industries, and are less likely to produce paths of democratic norms and institutions. Furthermore, oil industries hinder the development of manufacturing and agricultural industries by drawing labor and capital away from those two kinds of industries and by raising the real exchange rate and lowering prices of imported goods, referred to as the “Dutch Disease” (Ross 2013). Taken together, oil industries of autocratic regimes tend to produce less and restrain paths by which citizens learn about democracy.

2.4.3 Hypotheses

In order to specify precise hypotheses about the influence of oil trade ties on democratization, I decompose the effect of oil trade ties into three components. These include: *depth*, *breadth*, and *closeness* of trade ties.⁷ I illustrate these three components with two contrasting scenarios presented in Table 2-1.

First, the depth of an oil trade tie captures the total oil amount of an exporter’s oil trade ties. As illustrated in Table 2-1, for example, if State A exports a total of 40 metric tons of oil to two states, while State B exports a total of 30 metric tons to five states. The key issue that depth captures, therefore, is costs of breaking an oil trade tie. When the expected economic costs generated by a democratic importers policy decision to democratize an autocratic oil exporter are higher than the expected political benefits of the policy decision, we would expect little pressure to democratize. In other words, even if an autocratic oil exporter exports oil to many democratic great powers, if the autocratic oil exporter does not export a substantial amount of oil to them, its oil trade ties would not create policy conflict in the democratic great powers. Thus, the depth of an autocratic state’s oil trade ties should be considered. This expectation yields the first hypothesis:

⁷ These three components (breadth, depth, and closeness) are similar to Kinne’s (2012) measures for trade integration. Instead of capturing these general trade patterns, however, I use these measures to capture an exporter’s ability to resist external democratizing pressures due to the export-favored structure of the oil market.

Table 2-1. Hypotheses (H1-H4) and Centrality Indices

	State A (S_A)	State B (S_B)
	$V_i = \sum_{j=1}^n x_{ij} \quad (i \neq j)$	
H1: As Depth↑, Democratization↓	$S_A: 10 + 30 = 40$	$S_B: 5 + 5 + 5 + 7 + 8 = 30$
	<i>Depth: $S_A > S_B$</i> \therefore P(Democratization): $S_A < S_B$	
	$C_D(i) = \frac{1}{n-1} \sum_{j=1}^n a_{ij} \quad (i \neq j)$	
H2: As Breadth↑, Democratization↓	$S_A: \{1/(6-1)\} \times 2 = 0.4$	$S_B: \{1/(6-1)\} \times 5 = 1$
	<i>Breadth: $S_A < S_B$</i> \therefore P(Democratization): $S_A > S_B$	
	$d(i, j) = \min(a_{ih} + \dots + a_{hj})$	
	$C_C(i) = (n-1) \left[\sum_{j=1}^n d(i, j) \right]^{-1} \quad (i \neq j)$	
H3: As Closeness↑, Democratization↓	$S_A: (6-1) \times (1+1+2+2+2)^{-1} = 0.625$	$S_B: (6-1) \times (1+1+1+1+1)^{-1} = 1$
	<i>Closeness: $S_A < S_B$</i> \therefore P(Democratization): $S_A > S_B$	
	$d^w(i, j) = \min\left(\frac{1}{x_{ih}^\alpha} + \dots + \frac{1}{x_{hj}^\alpha}\right)$	
	$C_c^w(i) = \left[\sum_{j=1}^n d^w(i, j) \right]^{-1} \quad (i \neq j)$	
H4: As Oil Trade Influences↑, Democratization↓	$S_A: \{1/10^{0.5} + 1/30^{0.5} + (1/10^{0.5} + 1/10^{0.5}) + (1/30^{0.5} + 1/20^{0.5}) + (1/30^{0.5} + 1/10^{0.5})\}^{-1} = 0.49$	$S_B: (1/5^{0.5} + 1/5^{0.5} + 1/5^{0.5} + 1/8^{0.5} + 1/7^{0.5})^{-1} = 0.48$
	<i>Weighted Closeness: $S_A > S_B$</i> \therefore P(Democratization): $S_A < S_B$	

Note: The state number of oil trade networks including either State A or State B is six. In the oil trade networks, the black node is either State A or State B, and gray nodes are its oil trade partners. Thick arrows are State A's or State B's direct oil trade ties, and thin arrows are State A's or State B's indirect oil trade ties. All formulas in this table are explained in *Research Design*. In the H4 formula, the tuning parameter, α , is equal to 0.5.

H1: As the depth of an autocratic regime's oil trade ties increases, the likelihood of democratization in the autocratic exporter should decrease.

Second, the breadth of oil trade ties is a state's number of oil trade partners. This captures the mechanism by which an oil exporter is able to resist external democratization pressures by using its oil trade ties as strategic tools. As the autocratic oil exporter exports oil to more states, it is increasingly likely that policy preferences among the importing states will diverge. These divergent preferences are likely to hinder democratic great powers' abilities to democratize the exporter, thus hindering the likelihood of that the autocratic exporter will democratize. In Table 2-1, for example, State A exports oil to two states and State B exports to five states. Regardless of their oil export amount, State A is more likely to democratize than State B because State B can resist pressures from the five oil trade partners, while state A can resist pressure from the two oil trade partners. This leads to the second hypothesis:

H2: As the breadth of an autocratic state's oil trade ties increases, the likelihood of democratization for the autocratic exporter should decrease.

Third, the closeness of oil trade ties captures the level of a state's oil trade proximity to all other states, including states that it does not trade oil with directly. This measure emphasizes the indirect role that oil trade ties can play in the democratization process. For example, in 2012 Russia did not export oil to Chile. Yet, Chile imported oil from the United Kingdom, which is one of Russia's oil importers. Although Chile does not have a direct oil trade tie with Russia, the break of the oil trade tie between United Kingdom and Russia can affect the United Kingdom's oil reserves and, ultimately, its oil exports to other countries, including Chile. In Table 2-1, for example, State A exports oil to two states, and three other states have indirect linkages. Meanwhile, State B exports oil to five states that have no indirect linkages. In this scenario, although both states have five total linkages, three of State A's links are indirect

and are therefore downgraded in the closeness calculation.⁸ Because State B has a higher final score for closeness centrality, it should be more able to resist external democratizing pressures. Thus, if an autocratic oil exporter can directly or indirectly affect more states in the international oil trade market, its oil trade ties can more easily affect more states' economies. This should increase the likelihood of policy conflict among democratization-minded importers. This expectation yields the third hypothesis:

H3: As the closeness of an autocratic regime's oil trade ties increases, the likelihood of democratization in the autocratic exporter should decrease.

However, because these three hypotheses focus on one of oil trade ties' components, their tests may ignore variation in other components. In order to simultaneously examine their influences on democratization, a state's oil trade ties should be considered as combinations of the three components. I define the combination of three components of a state's oil trade ties as the "influence" of oil trade ties on the entire oil trade market. If oil trade ties of an autocratic oil exporter have a higher influence on the entire oil trade market, the exporter is more likely to create policy conflict among democratic great powers that may have divergent democratization preferences. In Table 2-1, for example, we see that the final calculation for influence captures the total export output (depth), the total number of importers (breadth), and factors in whether or not the tie is direct or indirect (closeness). In the final calculations, we see that the influence of State A on the oil trade network (0.49) is higher than the influence of State B (0.48). Thus, State A should be less likely to democratize than State B. This expectation yields the fourth hypothesis:

H4: As the level of influence of an autocratic regime's oil trade ties on the entire oil trade market

⁸ Unlike the calculation for breadth, which disregards indirect linkages, note that State A's score for closeness centrality (0.625) is higher than its score for breadth (0.4) because closeness centrality includes indirect ties into the calculation.

increases, the likelihood of democratization in the autocratic regime should decrease.

Table 2-2. Hypotheses (H5-H7) and Centrality Indices

	State A (S_A)	State B (S_B)
	<p>Polity: 10, Oil Reliance: 50%</p>	<p>Polity: 1, Oil Reliance: 30%</p>
	$di^w(i, j) = \min \left(\frac{1}{(x_{ih}/C_D(h))^\alpha} + \dots + \frac{1}{(x_{hj}/C_D(j))^\alpha} \right)$	
H5: As Oil Trade Partners \uparrow , Democratization \uparrow	$C_{ci}^w(i) = \left[\sum_{j=1}^n di^w(i, j) \right]^{-1} \quad (i \neq j)$	
	$S_A: \{1/(30/3)^{0.5}\}^{-1} = 3.16 \quad S_B: \{1/(30/2)^{0.5}\}^{-1} = 3.87$	
	<p style="text-align: center;"><i>Closeness-Indegree: $S_A < S_B$</i> \therefore P(Democratization): $S_A > S_B$</p>	
	$dr^w(i, j) = \min \left(\frac{1}{(x_{ih} \times r_h)^\alpha} + \dots + \frac{1}{(x_{hj} \times r_j)^\alpha} \right)$	
H6: As Oil Reliance \uparrow , Democratization \downarrow	$C_{cr}^w(i) = \left[\sum_{j=1}^n dr^w(i, j) \right]^{-1} \quad (i \neq j)$	
	$S_A: \{1/(30 \times 0.5)^{0.5}\}^{-1} = 3.87 \quad S_B: \{1/(30 \times 0.3)^{0.5}\}^{-1} = 3$	
	<p style="text-align: center;"><i>Closeness-Reliance: $S_A > S_B$</i> \therefore P(Democratization): $S_A < S_B$</p>	
	$dp^w(i, j) = \min \left(\frac{1}{(x_{ih}/p_h)^\alpha} + \dots + \frac{1}{(x_{hj}/p_j)^\alpha} \right)$	
H7: As Democracy Level \uparrow , Democratization \uparrow	$C_{cp}^w(i) = \left[\sum_{j=1}^n dp^w(i, j) \right]^{-1} \quad (i \neq j)$	
	$S_A: \{1/(30/10)^{0.5}\}^{-1} = 1.73 \quad S_B: \{1/(30/1)^{0.5}\}^{-1} = 5.48$	
	<p style="text-align: center;"><i>Closeness-Polity: $S_A < S_B$</i> \therefore P(Democratization): $S_A > S_B$</p>	

Note: In figures, the black node is either State A or State B, and gray nodes are its oil trade partners. Thick arrows are State A's or State B's direct oil trade ties, and thin arrows are State A's or State B's indirect oil trade ties. All formulas in this table are explained in the Research Design section of the paper. In the H4 formula, the tuning parameter, α , is equal to 0.5.

Thus far, the discussion has focused on the exporter in the oil trade market. However, there are three factors of oil importers that can affect the influence of a state's oil trade ties on democratization. The first factor is the number of oil importers in the oil trade market. Although the oil trade market has the exporter-favored structure as explained above, major oil importers can affect the market similar to the international markets of other products. That is, if a state imports oil from many states, the break of an oil trade tie with a single importer should affect its oil reserves only minimally. This implies that oil importers with more oil trade ties can reduce the influence of an autocratic exporter's oil trade ties on democratization because its oil trade ties are less likely to create policy conflict among the oil importers.

In Table 2-2, for example, even if State A and State B have a single oil trade partner and export 30 metric tons of oil to it, the importer may be able to secure oil from more than one state. State A's partner imports oil from three states total, for example, and State B's partner imports oil from two states. This means that State A's importer has more leverage over it than State B's importer because State A's importer can secure oil from two other sources. In contrast, State B's partner has only one alternative source of oil, so a break in its tie with State B is likely to be costly. Seeking to avoid this break, State B's partner should be unlikely to create policy conflict by challenging state B's domestic politics. This expectation yields the fifth hypothesis:

H5: As the number of oil trade ties of an autocratic oil exporter's trade partners decreases, the likelihood of democratization in the autocratic regime should decrease.

The second factor of oil importers is the level of the reliance on oil as an energy source. That is, if an oil importer relies on other kinds of resources as primary energy sources, such as coal or alternative energy, the break of the importers' oil trade tie would damage its economy little. This implies that an autocratic state's oil trade ties are less likely to create policy conflict among oil importers that rely less on

oil compared to importers that use oil as a primary energy source. In Table 2-2, for example, if the oil reliance of State A's oil trade partner is fifty percent and the oil reliance of State B's oil trade partner is thirty percent, State A is less likely to democratize than State B. This is because costs caused by the break of the oil trade tie with State A should be higher than costs caused by the break of oil trade tie with State B. This expectation yields the sixth hypothesis:

H6: As the level of the reliance of an autocratic oil exporter's trade partners on oil increases, the likelihood of democratization in the autocratic regime should decrease.

The last factor of oil importers is their democracy level. While the six previous hypotheses focused on the influence of oil trade ties on direct forces from democratic great powers or on policy conflict in the democracies, the democracy level of oil importers is related to the influence of oil trade ties on indirect transplantation. Although I assume that oil trade ties do not serve as paths of democratic norms and institutions because of the characteristics of oil industries, the possibility of oil trade ties as paths of democratic norms and institutions should be considered. In order to examine this, I assume that an oil trade tie of an autocratic exporter with a democratic importer with the higher democracy level can be a path that can convey democratic norms and institutions. For example, people from Western states more easily influence citizens in an autocratic oil exporter about democratic norms and cultures because they are more familiar with them compared to people from states with lower democracy levels. In Table 2-2, if State A exports oil to a state whose polity score is ten and State B exports oil to a state whose polity score is one, State A is more likely to democratize than State B because citizens in State A may have more chances to meet democratic norms and cultures through oil trade ties than citizens in State B. This expectation yields the final hypothesis:

H7: As the democracy level of an autocratic oil exporter's trade partners decreases, the likelihood of

democratization in the autocratic regime should decrease.

2.5 Research Design

The general expectation of this study is that democratization is less likely to occur if autocratic regimes export oil to democratic great powers. The unit of analysis to test of this study is the duration of authoritarianism measured yearly for all autocratic states from 1986 to 2008. This study examines democratization using the dichotomous democracy-autocracy measure developed by Przeworski et al. (2000), and updated by Cheibub, Gandhi, and Vreeland (2010). These scholars define a regime as a democracy if it meets all of the following four conditions: the chief executive must be elected; the legislature must be elected; there are at least two parties competing in elections; and at least one incumbent has been defeated under electoral rules. This measure takes the value one in the year that a country experiences the transition from autocracy to democracy, and “zero” otherwise. I refer to this measure as *Democratization*. This dataset covers all 70 countries that were under autocratic rule for at least one year between 1986 and 2008.

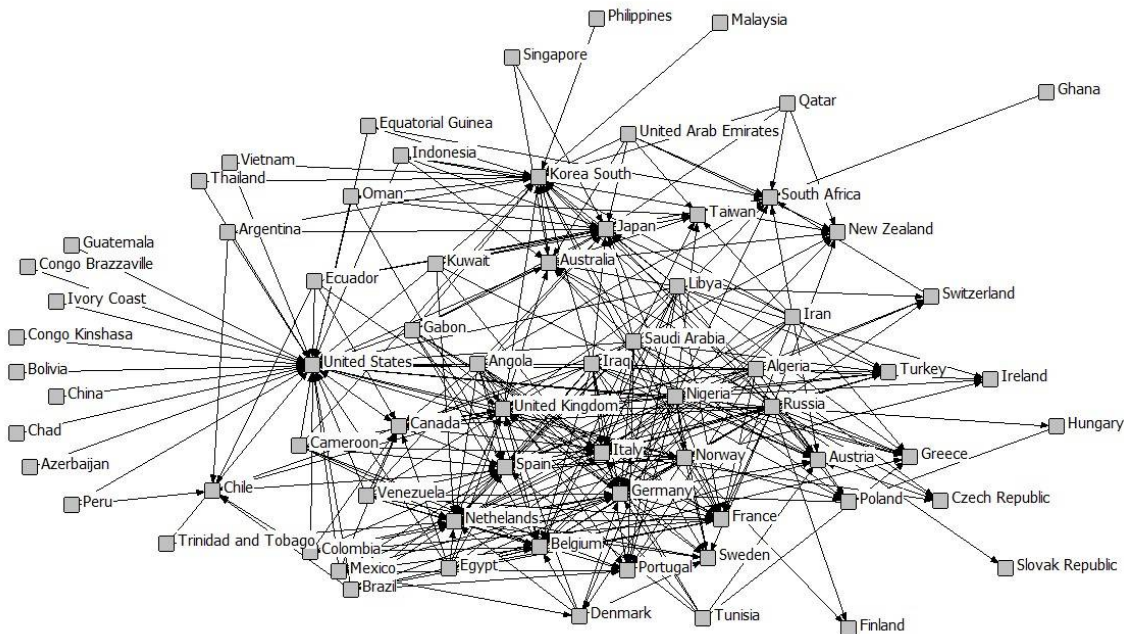
In order to examine the impact of oil trade ties upon democratization, I employ a hazard model that allows us to predict the likelihood that an event (democratization in this case) has ended in each time period, given that it has survived to that time period. Although past scholars have generally used the fixed-effects logit model to test the relationship between oil revenues and regime transitions (e.g., Haber and Menaldo 2011; Wright, Frantz, and Geddes 2014), they also argue that hazards models are alternative approaches that may do a better job dealing with unit heterogeneity and autocorrelation. Because I do not have expectations regarding the shape of the baseline hazard, I employ a Cox model in the analysis. The results presented in Table 2-3 are coefficients of Cox model, which identify the effect of each independent

variable on democratization when controlling for all other variables in the model. In other words, the results show the influence of the independent variables on the underlying baseline hazards. Positive values indicate that the variable decreases the duration of authoritarian regime survival, while negative values indicate a lengthened duration. Standard errors are clustered by country to account for potential unobserved state-level heterogeneity.

2.5.1 Oil Trade Ties and Network Centrality

In order to capture the influence of three components of a state's oil trade ties (depth, breadth, and closeness) on democratization, I employ network analysis, specifically closeness centrality in weighted networks. In network analysis, a network consists of a set of nodes (e.g., people, institutions, states) connected by a set of edges (e.g., friendship, alliance, trade) (Maoz 2009). Thus, the international oil trade market is a network comprised of states (nodes) and their oil trade relations (edges). The network is formally represented as an $n \times n$ adjacency matrix where matrix entries x_{ij} indicate a tie between node i and node j . Because oil export is more influential in the international oil market than oil import, oil trade ties are *directed*, or $x_{ij} \neq x_{ji}$. Network ties may be dichotomous, such that $x_{ij} = 1$ if a tie exists and $x_{ij} = 0$ otherwise. Or, they may be weighted, such that x_{ij} takes on some value indicating both the presence and the strength of the tie from i to j . I define a dichotomized oil trade tie from i to j as its presence, and a weighted oil trade tie from i to j as metric tons of oil that state i exports to state j . The oil trade ties are estimated by numerous oil trade datasets (see Online Appendix A). For a given year, the oil trade network is represented as adjacency matrix \mathbf{X} , which captures the totality of the trade network and indicates who trades oil with whom and at what levels. Based on these data, the oil trade network consists of 163 independent states and their oil trade ties with other states. Figure 2-1 is a sociogram of the oil trade network in 2008 that reveals the structure and flows of oil trade ties. In Figure 2-1, a node is a country, and an arrow is an oil trade tie indicating the direction of oil trade from an exporter to an importer.

Figure 2-1. The Structure of the Oil Trade Network in 2011.



Note: This figure describes the structure of the oil network. Each square indicates each state in the oil network, and each arrow is each oil trade relation between two countries. The direction of each arrow indicates the flow of each oil trade relation from an exporter to an importer. However, squares and arrows do not indicate geographical characteristics.

This study focuses on actor centrality, a network property associated with power and prestige of each node in a network (Maoz et al. 2007). Generally, substantive interpretation of centrality depends on the substance of the network. The arguments of the previous section suggest that an oil trade tie may be the source of an oil-exporting state’s ability to affect its trade partners’ policy decision and, ultimately, to resist their external democratizing pressures. That is, a central actor may easily create policy conflict among its trade partners and resist pressure. There are multiple measures of centrality. I employ two centrality indices in dichotomous networks, *degree* and *closeness* centrality, and a centrality index in weighted networks, *weighted closeness* centrality (Opsahl, Agneessens, and Skvoretz 2010). While the first two centrality indices measure one of oil trade ties’ three components, breadth and the closeness, the

weighted closeness centrality measures is a combination of all three components. These indices were presented earlier in Table 2-1. I provide additional clarification here.

First, the depth of a state's oil trade ties is to sum the value of a state's oil trade ties,

$$V_i = \sum_{j=1}^n x_{ij} \quad (i \neq j) \quad (1)$$

where x_{ij} denotes entries of the weighted oil trade network, \mathbf{X}_w . As I stated above, because the value of an oil trade tie is defined as the amount (metric tons) of oil that a state exports to other states, V_i is the total amount of oil that state i exports. I refer its natural log as *Oil Export (log)*. This measurement estimates the depth of a state's oil trade ties to test the first hypothesis (*H1*).

Second, degree centrality captures the total number of a state's oil trade partners in the dichotomized oil trade network, \mathbf{X}_D , where $x_{d,ij} = 1$ if i trades oil with j and equals zero otherwise. Because an oil trade network, \mathbf{X} , has different size for each year of data, degree centrality is divided by the maximum possible number of ties for a given node of a network to normalize and compare it across networks. The normalized degree centrality (C_D^i) is calculated by the following formula:

$$C_D(i) = \frac{1}{n-1} \sum_{j=1}^n a_{ij} \quad (i \neq j) \quad (2)$$

where a_{ij} is the oil trade tie between states i and j ($a_{ij} = 1$ if i trades with j and 0 otherwise), and n is the number of states in the oil network. As stated above, because oil trade ties are directed, degree centrality is classified into two indices: out-degree centrality (the number of oil export ties) and in-degree centrality (the number of oil import ties). However, because I focus on the ability of oil-exporting states to resist external democratizing pressures, I use only out-degree centrality and refer it as *Degree centrality*. This

centrality index is used to estimate the breadth of a state's oil trade ties (H2).

Third, closeness centrality identifies the sum of geodesic distances from a node to all others, defined as number of links in the shortest path between two nodes (Borgatti 2005). For example, if two states are immediately connected with each other, their geodesic distance is one. If the geodesic distance between state a and another state b is two, state a exports (or imports) oil to (or from) state c and the state c exports (or imports) oil to (or from) state b . The geodesic distance between i and j is calculated by the following formula:

$$d(i, j) = \min(a_{ih} + \dots + a_{hj}) \quad (3)$$

where, h are intermediary nodes on paths between node i and j . Closeness centrality also should be normalized by the maximum possible closeness centrality (the closeness centrality of a node who has immediate ties to all others) to compare across networks. I use the following formula:

$$C_c(i) = (n - 1) \left[\sum_{j=1}^n d(i, j) \right]^{-1} \quad (i \neq j) \quad (4)$$

where $d(n_i, n_j)$ is the distance between states i and j . Because oil trade ties in the oil trade network are directed, I use only out-closeness centrality to estimate the ability of oil-exporting states to resist external democratizing pressures. I refer it as *Closeness centrality*. This centrality index is the measurement used to estimate the closeness of a state's oil trade ties and to test the third hypothesis (H3).

Fourth, the geodesic distance calculation of the classical definition of closeness centrality using number of intermediate nodes as defined in equation (2) may mislead results, because heavy oil trade flows can suggest a higher level of indirect interdependence. Opsahl, Agneessens, and Skvoretz (2010) suggest that closeness centrality in weighted networks that have three aspects of ties (breadth, depth, and

closeness) can be captured through the use of a tuning parameter, α , that weights the shortest paths by strength of oil trade ties. They define the geodesic distance between i and j as

$$d^w(i, j) = \min \left(\frac{1}{x_{ih}^\alpha} + \dots + \frac{1}{x_{hj}^\alpha} \right) \quad (5)$$

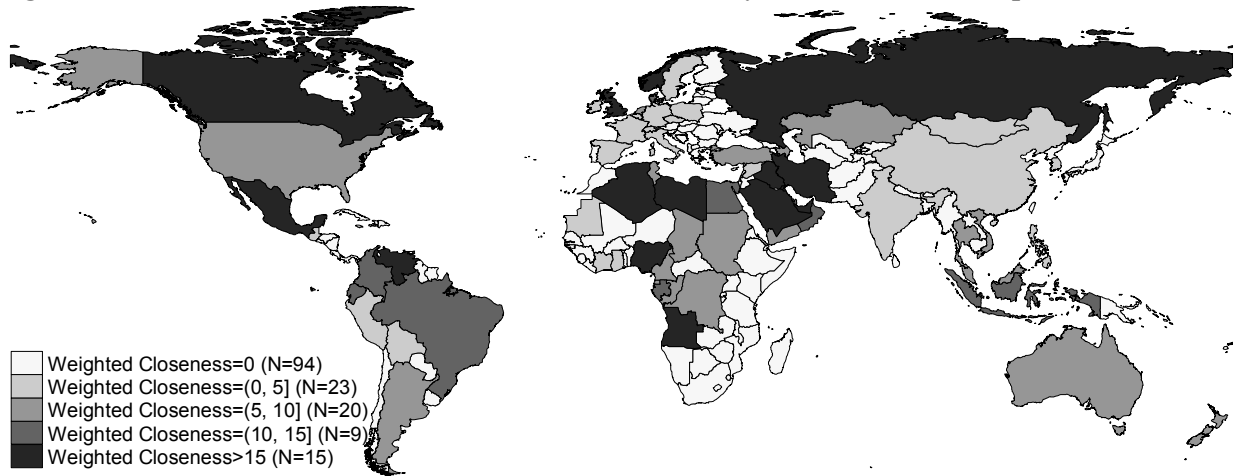
where, as before, h represents intermediate nodes. In equation (5), the value of α must be determined by theory (Kinne 2012). If $\alpha = 0$, $d^w(i, j)$ is equal to the minimum number of nodes between i and j , as the classical geodesic distance calculation from equation (2). As the value of α increases, stronger ties are more weighted, such that stronger ties are assumed to constitute shorter paths. In other words, the increase in the value of α favors stronger over weaker paths (Kinne 2012). Based on equation (5), Opsahl, Agneessens, and Skvoretz (2010) define closeness centrality in weighted networks as

$$C_c^w(i) = \left[\sum_{j=1}^n d^w(i, j) \right]^{-1} \quad (i \neq j). \quad (6)$$

Because oil trade ties in the oil trade network are directed, I use only out-closeness centrality in weighted networks to estimate the ability of oil-exporting states to resist external democratizing pressures. To balance breadth and depth of ties, I set α at 0.5.⁹ I refer to this measure as *Weighted Closeness*. This centrality index is the measure used to estimate the closeness of a state's oil trade ties and test the fourth hypothesis (*H4*). Figure 2-2 illustrates oil trade centrality levels across the world for the year 2008.

⁹ When $\alpha > 1$, the impact of additional intermediary nodes is relatively unimportant compared to the depth of ties and paths with more intermediaries, which is inconsistent with the logic of oil trade relationships. Also, while the depth of ties is ignored ($C_c^w(i) = C_c(i)$) when $\alpha = 0$, the breadth of ties is ignored $\alpha = 1$. Because of these characteristics of α , Kinne (2012) also set $\alpha = 0.5$ to capture the degree of trade integration.

Figure 2-2. The Pattern between Centralities and Democracy in Autocratic Oil exporters.



Note: Darker shading indicates greater oil trade centrality. Centrality scores calculated using C_c^w for directed weighted networks ($\alpha = 0.5$). Based on data from year 2008.

In order to test the remaining hypotheses, I employ additional measures capturing other kinds of depth of ties. First, in the fifth hypothesis, if an autocratic regime exports oil to a democratic regime that has more alternative oil trade ties, the trade tie would be less important and the likelihood that the autocratic exporter uses the trade tie as a strategic tool would decrease. This implies that a trade partner's in-degree centrality should be considered as the part of the depth of oil trade ties. In order to calculate this, I define the geodesic distance between i and j as

$$di^w(i, j) = \min \left(\frac{1}{(x_{ih}/C_D(h))^\alpha} + \dots + \frac{1}{(x_{hj}/C_D(j))^\alpha} \right) \quad (7)$$

where $C_D(j)$ is j 's in-degree centrality as defined in equation (1). Based on equation (7), closeness centrality in weighted networks including trade partners' in-degree centrality is calculated by the following formula:

$$C_{ci}^w(i) = \left[\sum_{j=1}^n di^w(i,j) \right]^{-1} \quad (i \neq j). \quad (8)$$

I refer to this measure as *Closeness-Indegree*. This centrality index is the measurement to estimate the closeness of a state's oil trade ties and test the fifth hypothesis (H5).

Second, if the energy consumption of a trade partner of an autocratic oil exporter relies less on oil, the break of the oil trade tie between them would not cause high costs to the trade partner (H6). This implies that the level of oil reliance of oil importers may affect the likelihood that an oil exporter uses its oil trade tie as a strategic tool. In order to calculate this, I measure the oil reliance of each state using *IEA's Energy Balance Flows*, and define the geodesic distance between i and j as

$$dr^w(i,j) = \min \left(\frac{1}{(x_{ih} \times r_h)^\alpha} + \dots + \frac{1}{(x_{hj} \times r_j)^\alpha} \right) \quad (9)$$

where r_j is j 's reliance on oil.¹⁰ Based on equation (9), closeness centrality in weighted networks including trade partners' reliance on oil is calculated by the following formula:

$$C_{cr}^w(i) = \left[\sum_{j=1}^n dr^w(i,j) \right]^{-1} \quad (i \neq j). \quad (10)$$

I refer to this measure as *Closeness-Reliance*.

Finally, although an oil trade tie is not theoretically a path of democratic norms or cultures, this possibility should be tested. If an oil trade ties can be a path of democratic norms or cultures, an autocratic oil exporter can be exposed to democratic norms and cultures when they export oil to a state

¹⁰ The oil reliance of each country is calculated by the ratio of oil production and oil imports to the entire energy consumption, using IEA's *Energy Balance Flows* (International Energy Agency 2014a).

with a higher level of democracy. Because I assume that oil trade ties between autocracies do not affect their democracy levels, only oil trade ties of an autocratic oil exporter with democracies are weighted. For example, if an autocratic regime exports oil to China, an autocratic oil importer, this trade tie would be weighted as zero. If an autocratic regime exports to Canada, a regime with the highest democracy level, this trade tie would be weighted as the trade volume of the tie multiplied by Canada's democracy level. The democracy level is measured by using the Polity 2 score of the Polity IV dataset (Marshall and Jagger 2008). Formally, the geodesic distance between i and j including democracy levels is

$$dp^w(i, j) = \min \left(\frac{1}{(x_{ih}/p_h)^\alpha} + \dots + \frac{1}{(x_{hj}/p_j)^\alpha} \right) \quad (11)$$

where p_j is equal to j 's Polity 2 score if j 's Polity 2 score is higher than one and p_j is equal to one otherwise. Based on equation (11), closeness centrality in weighted networks including trade partners' democracy level is calculated by the following formula:

$$C_{cp}^w(i) = \left[\sum_{j=1}^n dp^w(i, j) \right]^{-1} \quad (i \neq j). \quad (12)$$

I refer it as *Closeness-Polity*. This centrality index is the measurement used to estimate the closeness of a state's oil trade ties and test the seventh hypothesis ($H7$).¹¹

2.5.2 Control Variables

The most important control variable for this study, *Oil Income per capita*, captures the influence of oil revenues on domestic democratizing pressures. Ross (2013) and Haber and Menaldo (2011) used oil income per capita to measure the influence of oil revenues on domestic democratizing pressures, but their

¹¹ Centrality scores calculated with tnet package (Opsahl 2009) in R 3.1 (R development Core Team 2014).

measurements are different. While Ross (2013) measured oil income per capita as the total value of oil and gas production divided by a country's population, Haber and Menaldo (2011) measured it as the total value of crude oil production divided by population multiplied by the real world price. I argue that gas production should be excluded from oil income per capita because of the difference in which natural gas and oil are exported. Specifically, there are two ways to export gas: pipeline natural gas (PNG) and liquefied natural gas (LNG). Although PNG is a cheaper way to export gas than LNG, PNG can be restricted by geographical factors, such as distances or political conflict. Thus, while European states, Central Asian states, and Middle East and North African states generally import and export PNG, states in other regions, including North American and East Asian states, import and export LNG (Stern 2006). However, producing and exporting LNG requires technology from high-income states, which are the main consumers of natural gas. This means that gas export depends more on importers than oil export and natural gas rents may be much lower than oil rents. As a result, I measure *Oil Income per capita* as the total value of crude oil production (metric tons), divided by population, multiplied by the real world price, and expressed in 2013 dollars.

Several variables considered in past studies are also included as control variables. The second control variable is *GDP/capita*, which measures the natural log of GDP per capita based on data from Gleditsch (2002b). Most prior studies on democratization have revealed that higher income is likely to facilitate democratization (e.g., Boix and Stokes 2003). The third control variable is *Post-Cold War*, which is a dummy variable that takes the value "1" if a year is in the period from 1991 and the value "0" otherwise. Boix (2011) argued that the international system governed by a democratic hegemon, such as the post-Cold War period, is likely to increase the proportion of liberal democracies. Also, although prior studies have included a measure of neighboring country democratic transitions in the prior year to control the diffusion effect of democratization (Haber and Menaldo 2011; Wright, Frantz, and Geddes 2014), this

is a part of external democratizing pressures (Linz and Stepan 1996). Because the democratization diffusion in the third wave of democracy nearly coincided with the start of the post-Cold War period, the variable *Post-Cold War* can control these two possibilities. The fourth control variable is *Civil War*, a dummy variable (lagged one year) from the Correlates of War (COW) Intra-State War Dataset (Sarkees and Wayman 2010). This variable allows us to avoid conflating the effects of oil caused by conflict.

2.6 Results

I begin by examining the influence of centrality indices on democratization in Table 2-3. All models can be interpreted similarly with positive coefficients indicating that democratization becomes more likely as the independent variable increases. In Table 2-3, the dependent variable is *Democratization*. Each model in Table 2-3 includes one independent variable and the control variables to examine each hypothesis.

The negative and statistically significant coefficients of independent variables in Models 1-7 in Table 2-3 provide initial support for the general expectations for oil trade ties of autocratic oil exporters. The indices in Table 2-3 give us a basic understanding of how oil trade ties of autocratic oil exporters reduce external democratizing pressures and their likelihood of democratization. Also, in substantive terms, the influence of oil trade ties on democratization is considerable. In Models 1-7, the hazard of democratization decreases by about 20 percent if a state experiences one score increase in *Degree Centrality*, and decreases by about 9 percent if a state experiences one score increase in *Weighted Closeness*. However, *Oil Export* and *Closeness Centrality* are not statistically significant in Model 1 and in Model 3. This implies that the depth and closeness of oil trade ties is less likely to affect democratization of autocratic oil exporters than the breadth of oil trade ties. That is, an autocratic oil

exporter is likely to hinder democratization if the exporter exports oil to more states rather than to export more oil to states or to important oil importers in the oil trade market.

In Models 5-7, the hazard of democratization also decreases by about 9 percent if a state experiences one score increase in *Closeness-Polity*, *Closeness-Reliance*, or *Closeness-Indegree*. This implies that the ability of an autocratic oil exporter to resist external democratizing pressures is affected by characteristics of its oil trade partners. For example, if an autocratic state exports oil to a more democratic state, a state that relies less on oil, or a state that imports oil from more states, the exporter's ability to resist external democratizing pressures would be lowered.

Figure 2-3. Predicted Survival Functions for Model 4

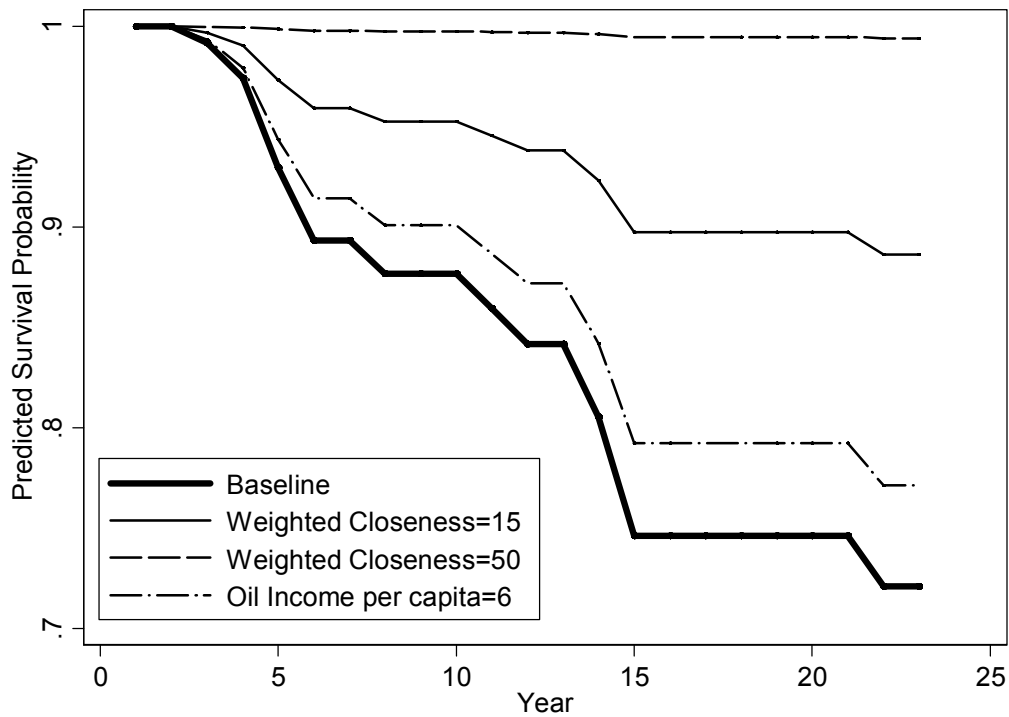


Table 2-3. Oil Trade Network Centrality and Democratization, 1986-2008.

	Model 1 (H1)	Model 2 (H2)	Model 3 (H3)	Model 4 (H4)	Model 5 (H5)	Model 6 (H6)	Model 7 (H7)
<i>Oil Export (log)</i>	-0.001 (0.0001)						
<i>Degree Centrality</i>		-0.211** (0.096)					
<i>Closeness Centrality</i>			-8.621 (5.498)				
<i>Weighted Closeness</i>				-0.087* (0.050)			
<i>Closeness-Polity</i>					-0.081* (0.044)		
<i>Closeness-Reliance</i>						-0.100* (0.056)	
<i>Closeness-Indegree</i>							-0.095* (0.052)
<i>Oil Income per capita (log)</i>	-0.144* (0.085)	-0.086 (0.088)	-0.096 (0.089)	-0.100 (0.089)	-0.102 (0.088)	-0.095 (0.088)	-0.098 (0.088)
<i>GDP/capita (log)</i>	0.413* (0.219)	0.394* (0.217)	0.345 (0.221)	0.394* (0.221)	0.394* (0.221)	0.403* (0.221)	0.400* (0.222)
<i>Post-Cold War</i>	-0.422 (1.147)	-0.614 (1.139)	-1.260 (1.541)	-0.539 (1.162)	-0.520 (1.152)	-0.560 (1.159)	-0.536 (1.155)
<i>Civil War</i>	-0.416 (1.034)	-0.383 (1.077)	-0.382 (1.064)	-0.351 (1.049)	-0.359 (1.036)	-0.357 (1.057)	-0.347 (1.052)
<i>N</i>	932	932	932	932	932	932	932
<i>N_{States}</i>	61	61	61	61	61	61	61
<i>N_{Democratization}</i>	18	18	18	18	18	18	18
<i>Wald chi2</i>	10.45*	15.00**	12.03**	11.78**	12.26**	12.00**	11.82**

*p<.10, **p<.05, ***p<.01 (two-tailed).

^aCell entries report coefficients and cluster-corrected standard errors (in parentheses) from Cox regressions.

In order to clarify the influence of oil trade ties on democratization, Figure 2-3 provides a graphical interpretation of the main results from Model 4. This figure demonstrates how the predicted survival changes compared to a baseline scenario when all covariates are held constant at their means (for continuous measures) and modes (for dichotomous measures).¹² In Figure 2-3, for the baseline prediction, we see that 75 percent of autocratic regimes are not democratized after 20 years. When an autocratic regime has “15” *Weighted Closeness* in the oil network, such as Venezuela, we see that the increase in *Weighted Closeness* improves the probability that autocratic regimes are not democratized after 20 years to 90 percent. If an autocratic regime has “50” *Weighted Closeness*, such as Saudi Arabia, its survival probability will be 99 percent after 20 years. This result reveals that the higher levels of *Weighted Closeness* in the oil network substantially reduce the likelihood of democratization.

Regarding the control variables, we see results that coefficients of control variables are supportive of previous analyses. First, in Models 1-7, increase in *Oil Income per capita (log)* reduces the likelihood of democratization. This result supports empirical results of previous studies (e.g., Smith 2004; Morrison 2009; Ross 2009; Aslaksen 2010). In Figure 2-3, when oil income per capita of an autocratic regime is about 430 dollars, such as Russia, we see that the increase in *Oil Income per capita (log)* improves the probability that autocratic regimes are not democratized after 20 years to 78 percent. In addition, in Models 1-7, increases in *GDP/capita (log)* improves the likelihood of democratization. This result is supportive of prior analyses (e.g., Przeworski and Limongi 1997; Boix and Stokes 2003). However, in Models 1-7, all control variables except *GDP/capita (log)* are not statistically significant. This result might be derived from the number of democratization cases. That is, the oil trade dataset includes cases from 1986, while the dichotomous democracy-autocracy measure includes cases to 2008.

¹² The baseline scenario is a state with “3.5” *Weighted Closeness*, about 1 dollar oil Income per capita, about two thousand dollars GDP per capita, the Post-cold War period, and non-civil war period.

Thus, Models 1-7 with four control variables examine the period from 1986 to 2008 that include 18 democratization cases. This might affect statistical significance of control variables.

2.7 Robustness

We should consider several issues to assure the robustness of the primary findings, including the dependent variable and the sample. Prior studies have generally tested influences of oil on the level of democracy as a main model or a robustness check. Although the statistical analysis using the level of democracy does not distinguish between the impact of oil on autocratic states and its impact on democracies, it is still useful to include as a robustness check (Ross 2009). Thus, I use the Polity 2 score (Marshall and Jagger 2008).¹³ The Polity 2 score represents a country's democracy score minus its autocracy score, the 21-point scale. I refer to this measure as *Polity*. The Polity IV data cover 170 states, both autocratic and democratic, that were sovereign in the year 2000 and had populations greater than 200,000. Empirical models using the Polity IV data include 2363 country-years. To test the influence of oil trade ties with this dependent variable, I use a linear regression model with panel-corrected standard errors. Although prior studies have tested similar measures with fixed-effects models (e.g., Haber and Menaldo 2011), the fixed-effects model has two shortcomings (Wilson and Butler 2007): time-invariant variables cannot be included in the model; and slowly moving variables, or sluggish variables, would have high standard errors because the variables might be highly correlated with the fixed effects (Beck 2001). Because the level of democracy or influences of oil trade ties changes little over time and the oil trade dataset includes a relatively short time span (1986-2012), the fixed effects model might underestimate the influence of each variable. In order to avoid this possibility and reduce serial

¹³ The Polity 2 score is an index of the competitiveness of political participation, the openness and competitiveness of executive recruitment, and the constraints on the chief executive that is coded for every country in the world from 1800 onwards.

correlation and the unit heterogeneity problem, I use the linear regression model with panel-corrected standard errors, specifically the first-order autocorrelation structure.

Table 2-4. The Oil Trade Network Centrality and the Level of Democracy, 1986-2012.

	Model 8	Model 9	Model 10	Model 11
<i>Weighted Closeness</i>	-0.064*** (0.017)			
<i>Closeness-Polity</i>		-0.055*** (0.015)		
<i>Closeness-Reliance</i>			-0.082*** (0.018)	
<i>Closeness-Indegree</i>				-0.035** (0.014)
<i>Oil Income per capita (log)</i>	-0.246*** (0.075)	-0.257*** (0.075)	-0.237*** (0.075)	-0.268*** (0.076)
<i>GDP/capita (log)</i>	2.043*** (0.212)	2.042*** (0.212)	2.072*** (0.212)	2.009*** (0.215)
<i>Post-Cold War</i>	0.760** (0.366)	0.759** (0.367)	0.763** (0.365)	0.748** (0.367)
<i>Civil War</i>	-0.395* (0.204)	-0.398* (0.204)	-0.398* (0.205)	-0.398* (0.204)
<i>Constant</i>	-15.405*** (2.055)	-15.397*** (2.050)	-15.631*** (2.049)	-15.172*** (2.083)
<i>N</i>	2,285	2,285	2,285	2,285
<i>R-squared</i>	0.036	0.037	0.038	0.032
<i>N_{States}</i>	106	106	106	106
<i>Wald chi2</i>	115.3***	115.6***	122.3***	102.2***

*p<.10, **p<.05, ***p<.01 (two-tailed).

^aCell entries report coefficients and cluster-corrected standard errors (in parentheses) from linear regressions with panel-corrected standard errors.

I provide results of robustness checks in Table 2-4. Each model in Table 2-4 includes one independent variable and the control variables. All models can be interpreted similarly with positive coefficients indicating that an increase in the independent variable increases the level of democracy.

The negative and statistically significant coefficients of independent variables in Models 8-11 in Table 2-4 reveal that oil trade ties of an autocratic oil exporter decreases the level of democracy. This

result is similar with initial support for the general expectations for the effect of oil trade ties on the level of democracy. In substantive terms, the influence of oil trade ties is considerable. In Models 8-11, as a state experiences one score increase in the centrality indices, the level of democracy decreases by about 0.07 or about 0.04 score. This implies that oil trade ties might decrease the level of democracy both in autocracies and in democracies. This result also reveals that the influence of a state's oil trade ties on the level of democracy may decrease if the state exports oil to a more democratic state, a state that relies less on oil, or a state that imports oil from more states.

Regarding the control variables, in Models 8-11, increase in *Oil Income per capita (log)* reduces the level of democracy. This result does not support empirical results of previous studies (e.g., Dunning 2008; Haber and Menaldo 2011) that oil revenues are not associated with autocratic regimes or they increase the level of democracy as a resource blessing. This result reveals that if we control for the influence of oil trade ties on external democratizing pressures, oil revenues are likely to decrease the level of democracy. In addition, in Models 8-11, increase in *GDP/capita (log)* and the post-Cold War improves the level of democratization. These results are supportive of prior analyses (e.g., Przeworski and Limongi 1997; Boix 2011).

2.8 Conclusion

This paper explores the influence of oil on external democratizing pressure. The influence of oil on external democratizing forces has been relatively neglected in the research on the relationship between oil and democratization. I argue that oil trade ties of autocratic oil-exporting states with democratic importers are likely to improve the ability of the autocratic exporters to resist external democratizing pressures. In order to analyze these influences, I decompose oil trade ties into three components, depth, breadth, and

closeness, and estimate how these factors influence democratization with network analysis, specifically centrality indices.

The empirical results provide two implications for the oil curse literature. First, when we analyze the influences of oil on democratization, both domestic and external democratizing pressures should be considered. The results reveal that oil trade ties of an autocratic oil exporter hinder democratization. Specifically, if an autocratic state exports oil to more states or is able to more strongly affect all states in the international oil market, it will be more likely to avoid democratization. In addition, characteristics of oil importers may affect the ability of an autocratic exporter's oil trade ties to resist democratization. If an autocratic state exports oil to more democratic states or states that import oil from more states, the ability of oil trade ties to resist external democratizing pressures is reduced. However, if an autocratic state exports oil to states with a high reliance on oil, the ability of oil trade ties increases. The robustness checks also reveal that these results are applicable to the level of democracy.

Second, the empirical results support arguments of prior studies on democracy. Higher oil revenues hinder democratization or reduce the level of democracy. This implies that oil revenues are likely to dampen domestic democratizing pressures. In addition, higher *GDP/capita* levels and the post-Cold War period facilitates democratization and increases the level of democracy.

However, this study has a limitation. In order to measure influences of autocratic oil exporters on external democratizing pressures, I use the dyadic oil trade data from several sources (See Online Appendix A). Because main importers in the international oil trade market open data about their oil trade ties, the data that this study uses include most parts of all oil trade ties. However, as discussed in the review of prior studies, most autocratic oil-exporting states try to avoid open oil trade data (Ross 2013). Thus, the oil trade dataset of this study does not perfectly cover all oil trade ties, especially oil trade ties between autocracies. In addition to this, the oil trade dataset covers the period from 1986 to the current period. Because democratization phenomena have occurred for over a century, this dataset cannot reveal

the long term trend of democratization. It seems that this also affects the statistical significance of control variables in Models 1-7 and hinders the analysis of the Latin America exception with influences of oil trade ties on external democratizing pressures. Despite these limitations, this study provides a solid first step to better understanding influences of oil on external democratizing pressures.

3. Oil Exit Costs, Prior Intervention and the Onset of Civil War

3.1 The Puzzle and Purpose

In 2010, many states in Middle East and Northern Africa (MENA) faced a revolutionary wave, including protests, riots, and civil wars, called the Arab Spring. For example, the Libyan government collapsed due to Western states' military intervention in 2011. However, some states in MENA, such as Saudi Arabia and Qatar, have experienced only minor protests that rarely affected their regimes. Previous studies have argued that political stability of states in the MENA is likely to be weakened because oil either allows governments to rely less on taxes and weakens their state apparatuses (Fearon and Laitin 2003) or helps rebel sides to mobilize rebels as potential financial sources (Ross 2004; Humphreys 2005). However, this argument rarely explain why two contrasting trends in the MENA occurred in the Arab Spring period. I argue that these trends cannot be explained if we focus only on how oil affects domestic actors.

Third parties care about the MENA states' domestic political stability. This is because although a limited number of states, especially states in the MENA, can produce and export oil, most states use oil as a primary energy source. This exporter-favored international oil market structure makes oil-importing states more sensitive to political instability in oil-exporting states. For example, in 1979 the Iranian Revolution hindered oil production and exports to other states, which drove up crude oil prices in the international oil market (British Petroleum 2014). This significantly damaged oil-importing states' economies.¹⁴ This implies that the break of oil trade ties caused by political instability in an oil-exporting state may generate high costs to oil-importing states. Thus, I argue that oil-importing states are likely to intervene in an oil-exporting state, which has a political instability problem, to avoid the break of their oil

¹⁴ For example, after the oil crisis derived from Iranian Revolution, the world economic growth decreased from 4.14 percent in 1979 to 1.83 percent in 1980 (World Bank 2013).

trade ties and the prewar interventions affect civil war onset. That is, oil-exporting states' oil trade ties could be, intentionally or unintentionally, used as strategic tools to attract support from oil-importing states and to hinder civil war onset. I specify this argument with the concept of exit costs, which considers the opportunity costs that are incurred if economic ties with a partner are severed (Crescenzi 2003).

In order to measure the ability of an oil-exporting state's oil trade ties to attract external support, I employ a social network approach to trade, focusing on the concept of closeness centrality in weighted networks. The closeness centrality index indicates the level of each state's influence on the international oil market and its ability to attract external support. This index captures three components of oil trade ties: depth (the total oil export amount of a state's oil trade ties), breadth (an oil-exporting state's number of oil trade partners), and the closeness of oil trade ties (the level of an oil-exporting state's oil trade proximity to all other states). Each component specifies how oil trade ties attract external support. The main finding of this study indicates that an oil-exporting state's oil trade ties encourage external support for its government and affect the likelihood of civil war onset.

The remainder of this paper is organized as follows. In the first section, a brief review of the literature on the influences of natural resources on civil war onset reveals that prior studies have focused more on how natural resources influence two internal actors, the government side and the rebel side, without paying much attention to the effect of natural resources in conflict-prone regions on third-parties, who can affect the likelihood of civil war onset. In the second section, I introduce the concept of prewar intervention, and develop a theoretical framework to study how an oil-exporting state's oil trade ties attract external support for its government, which may affect the likelihood of civil war onset. The third section defines the international oil trade network, and examines the influence of oil-exporting states' oil trade ties on prewar intervention and civil war onset. In the final section, I discuss the implications of the results.

3.2 Natural Resources and the Onset of Civil War

Most prior studies have argued that natural resources increase the likelihood of civil war onset in two ways. First, some scholars have emphasized the influence of oil on state apparatuses (e.g. Ross 2001; Fearon and Laitin 2003; Humphreys 2005). They have argued that oil-funded political leaders tend to have weaker state apparatuses because they rely less on “a socially intrusive and elaborate bureaucratic system” (Fearon and Laitin 2003, 81) to raise tax revenues (*the weak states mechanism*). That is, oil revenues allow governments to rely less on state-society linkages and be less responsive to their citizens (Beblawi and Luciani 1987). The weaker state apparatuses are less likely to hinder rebel mobilization (Fearon and Laitin 2003).

Second, prior studies have suggested two mechanisms, *the grievance mechanism* and *the greedy rebel mechanism*, to explain the influence of natural resources on the rebel side. The grievance mechanism argues that resource extraction may generate grievances among the local population, which provides the fuel for rebel mobilization through forced migration (Ross 2004; Humphreys 2005). For example, logging or mining firms may expropriate land from people, deprive them of any benefits from the land, or cause environment damages, such as the extraction process in Ache and Papua New Guinea (Gedicks 2001; Klare 2001). Labor migration in these processes causes insufficient job opportunities in the region, social disruptions, and unjust resource wealth distribution, such as in Sierra Leone, Nigeria, Niger, and Chad (Humphreys 2005). Also, the vulnerability of economies depending on natural resource revenues to trade shocks and wealth redistribution might generate grievances. These grievances then facilitate rebel mobilization.

The greedy rebel mechanism argues that natural resources are financial sources that allow rebel leaders to mobilize armed forces (Collier and Hoeffler 2004; Ross 2004; Humphreys 2005). Rebel leaders raise money by selling both natural resources and “booty futures” (Humphreys 2005; Ross 2005). That is, rebels in regions with natural resources more easily fund the start-up costs of initiating a rebellion (Collier

and Hoeffler 2004; Ross 2004). In addition, if natural resources are concentrated in a particular region in a state, the local population in the region may believe that a seceding state would be viable and prosperous (Ross 2003). This implies that natural resources increases the value of capturing the state or seceding (Collier and Hoeffler 2004; Fearon and Laitin 2003).

However, empirical results in prior studies have not clearly and consistently revealed that natural resources increase the likelihood of civil war onset. While Collier and Hoeffler (2004, 2006) and Hegre (2002) showed that higher natural resource revenues are likely to cause civil war outbreak using the ratio of primary exports to GDP, Elbadawi and Sambanis (2002) and Fearon and Laitin (2003) revealed weak or no effect of natural resource revenues with the same measurement. In order to specify the effect of natural resources on civil war onset, Snyder and Bhavnani (2005) and Lujala et al. (2005) classified natural resources into two groups: lootable (resources that have low economic barriers to entry and can be profitably exploited by small-scale artisans, including rebels) and non-lootable (resources that require large amounts of capital and technology to exploit that allow the government to establish monopoly control over them). They argue that lootable resources may provide financial opportunities that rebel leaders use to mobilize rebels while non-lootable resources rarely affect rebel mobilization. However, although their empirical results supported that lootable resources increase the likelihood of civil war onset, they rarely explain why the empirical results revealed that non-lootable resources reduce the likelihood of civil war.

I argue that the ambiguous empirical results have been generated by the insufficient attention to the influence of resources on third parties although resource revenues are generally generated by international or transnational trade. That is, civil war in a resource-exporting state can affect its resource trade partners. This implies that resource trade ties as economic linkages can affect the likelihood of civil war onset (de Soysa 2002; Gleditsch 2002a, 2007). However, most prior studies have measured the influence of natural resources on civil war onset only as potential financial sources, such as the ratio of

primary commodity exports to GDP (e.g. Collier and Hoeffler 2004, 2006; Elbadawi and Sambanis 2002; Fearon and Laitin 2003; Hegre 2002; Søril, Gleditsch, and Strand 2005), or the amount of natural resource production and reserves (e.g. Humphreys 2005; Lujala et al. 2005). Although a few studies have used the status of resource exporter as a binary variable (e.g. de Soysa 2002; Fearon and Laitin 2003; Colgan 2014), this measurement may not specify how resource trade ties affect prewar interventions, which can affect civil war onset.

This study focuses on oil trade ties, because oil as a non-lootable resource is an economically and strategically important resource in most states but a limited number of states can produce it. These characteristics of oil highlight how non-lootable resource trade ties attract prewar intervention and affect civil war onset. In order to draw out the causal mechanisms between oil and civil wars, in the following section I review the concept of prewar intervention, and apply exit costs and exit cost threshold (Crescenzi 2003) to the relationship between oil trade ties and prewar intervention to reveal oil trade ties as unintended or intended leverage that attract external support from oil-importing states.

3.3 Prewar Intervention and Civil War

A large literature argues that external actors can play a critical role in the bargaining between the government and rebel groups and affect the likelihood of civil war because they can alter the capabilities or information sets of the competing groups within a state (Cetinyan 2002; Thyne 2009). However, the civil war literature has rarely specified and has empirically tested why external actors decide to intervene in a state prior to civil war onset and how the prewar interventions can affect the likelihood of civil war. In order to analyze them, prewar intervention should be clearly defined. Prewar interventions are defined as external interventions into a state where political instability is sufficiently high that can substantively cause civil war onset but as yet there has been no recourse to organized armed conflict (Regan and

Meachum 2014). For example, in 2002, the United States declared freezing the financial assets of East Turkestan Islamic Movement (ETIM), a terrorist group to promote independence for the northwestern Chinese region of Xinjiang, because the United States tried to support China as counterterrorism cooperation (Khan 2009). This is a prewar intervention case, because the ETIM had an obvious intention to wage a civil war to secede Xinjiang from China and consistently waged a violent separatism campaign that can cause civil war onset. However, the intervention in a politically stable state, which little has the likelihood of civil war onset, is not a prewar intervention. In the following sections, I specify how an oil-exporting state's oil trade ties can affect prewar intervention and the likelihood of civil war onset with exit costs and exit costs thresholds.

3.4 Oil Trade Ties, Exit Costs, and Prewar Intervention

In order to specify the relationship between international trade and interstate conflict, Crescenzi (2003) suggested two concepts, exit costs and exit cost thresholds. The concept of exit costs assumes that states try to maximize welfare in their economic relationships, and the costs involved in existing relationships are what are lost in switching from the best option to the next best alternative (Crescenzi 2003). "Exit costs" are the opportunity costs associated with these alternatives, and the "exit cost threshold" is the degree of exit costs beyond which a state cannot endure. Exit costs are determined by two factors: asset specificity and market structure. First, asset specificity is the degree to which an asset can be replaced by an alternative (Williamson 1996). This implies that an important resource without an alternative makes resource importing-states vulnerable to exporting-states, while a fungible resource allows resource importing-states to adapt to potential changes (Hirschman 1945). Second, market structure determines the possibility that a state can establish a new trade tie with an alternative trade partner. If alternatives are scarce, a state cannot easily break its trade ties and its exit cost is high. That is, the ability to find substitutes in the market is a determinant of opportunity costs (Gowa 1994). Based on these two concepts,

Crescenzi (2003) argued that a state might use its trade tie as bargaining power over an independent issue. If exit costs of a target who desires to remain at the status quo are greater than its exit cost threshold, a challenger who wants something from a target makes a demand and the target complies. That is, an economic tie can be the bargaining leverage of a challenger without sacrificing the possibility of the use of military tools when necessary (Keohane and Nye's 1989).

Exit costs explain how an oil-exporting state's oil trade ties attract external support for its government. In the international oil market, oil is a primary energy source in most states, although a limited number of states can produce and export it. Thus, asset specificity of oil is high, and the international oil market has an exporter-favored structure. This implies that an oil-importing state is vulnerable to the break of its oil trade tie because its oil exit costs are likely to be higher than its oil exit cost threshold. This suggests that an oil-exporting state's oil trade tie can be a bargaining leverage without sacrificing the possibility of the use of military tools when necessary.

Moving to the domestic realm, when an oil-exporting state has a political instability problem, oil-importing states may fear that the instability problem might break their oil trade ties. For example, as mentioned above, the 1979 Iranian Revolution broke its oil trade ties and damaged many oil-importing states' economies. This implies that an oil-exporting state as a challenger can request support from its oil trade partners (its target states) by using its oil trade ties. Or, oil-importing states may voluntarily support the oil exporter's government to resolve its political instability problem and to avoid the break of their oil trade ties. Thus, although Crescenzi (2003) assumed a challenger's intentional use of its trade tie, an oil-exporting state's oil trade ties may both intentionally and unintentionally attract third parties' prewar intervention to resolve its political instability problem. This leads to the first hypothesis:

H1: As the level of influence of an oil-exporting state's oil trade ties on the entire oil trade market increases, the likelihood of a prewar intervention in the oil-exporting state should increase.

Oil-importing states may intervene in an oil-exporting state to reduce the likelihood of civil war onset and to avoid the break of their oil trade ties. This implies that the oil-importing states prefer the status quo because civil conflict and its results, including regime transition, might break their oil trade ties. Thus, oil-importing states are more likely to support an oil-exporting state's government to avoid the break of their oil trade ties, and are more likely to choose neutral mediation that is a peaceful way to resolve a social conflict without the break of oil trade ties. However, support for rebels may aggravate a political instability problem in an oil-exporting state, and may facilitate the break of its oil trade ties, because support for rebels encourages a rebel leader to mobilize rebels and initiate civil war (Ross 2004; Humphreys 2005). This implies that oil-importing states are less likely to support rebels. These expectations yield the following three hypotheses:

H2: As the level of influence of an oil-exporting state's oil trade ties on the entire oil trade market increases, the likelihood of a prewar intervention in the oil-exporting state to support the government side should increase.

H3: As the level of influence of an oil-exporting state's oil trade ties on the entire oil trade market increases, the likelihood of a neutral prewar intervention in the oil-exporting state should increase.

H4: As the level of influence of an oil-exporting state's oil trade ties on the entire oil trade market increases, the likelihood of a prewar intervention in the oil-exporting state to support the rebel side should decrease.

3.5 Oil Exit Costs and Onset of Civil War

Although I argue that an oil-exporting state's oil trade ties attract external support for its government or

neutral intervention to resolve its political instability problem, this does not mean that the prewar intervention or the possibility of prewar intervention reduces the likelihood of civil war onset. This is because civil wars begin when actors fail to find an acceptable bargaining range to resolve competing interests (Cetinyan 2002). Interveners can change the range of the bargaining area between the government and rebels, but do not affect the likelihood of civil war onset (Cetinyan 2002; Thyne 2009). Instead, one of explanations for why states choose to fight with rebels despite the existence of less costly alternatives is disagreement over the likely outcome of war, called information problems (e.g., Walter 2009). There are two information problems that could make civil war a rational option (Walter 2009). First, both sides have private information about their own capabilities and willingness to engage in battle, but might be uncertain about their adversary's ones. Second, both sides have strong incentives to misrepresent this information to pursue a better deal. The two information problems may encourage both sides to disagree about an acceptable bargaining range and to choose civil war.

The information problems can explain how an oil-exporting state's oil trade ties affect civil war onset. Oil-exporting states, especially autocratic oil-exporting states, try to conceal information about oil wealth from the public (Ross 2013). If the public knows the information about oil wealth, it may engender grievances about the unequal distribution of oil wealth or the government's incompetence related with oil industry management and, thus, the grievances can facilitate rebel mobilization (Ross 2004; Humphreys 2005). However, oil-exporting states easily collude to conceal the information about their oil industries, because they are generally managed by national oil companies or by the relationship between governments and international oil companies. This implies that rebels are less likely to have complete information about their government's oil trade ties and, thus, the likelihood of external support for the government caused by its oil trade ties. If rebels underestimate the likelihood of external support for the government due to incomplete information, the bargaining failure would be likely.

However, if an oil-exporting state already experiences external support for its government, its

rebel groups would be certain that the likelihood of external support for the government from oil-importing states to avoid the break of their oil trade ties is substantial. Furthermore, given this, the increase in the effect of an oil-exporting state on the international oil trade market may make its rebel groups more certain that oil-importing states will support its government. This implies that the presence of external support for an oil-exporting state's government may reduce information problems that can cause the disagreement between both sides about an acceptable bargaining point and may reduce the likelihood of civil war onset. This expectation yields the fifth and sixth hypotheses:

H5: Increase in the level of influence of an oil-exporting state's oil trade ties on the international oil trade market should decrease the likelihood of civil conflict in the oil-exporting state with external support for its government side, but should increase the likelihood of civil conflict in the oil-exporting state without external support for its government side.

H6: As the level of influence of an oil-exporting state's oil trade ties on the entire oil trade market increases, external support for the government side of the oil-exporting state should decrease the likelihood of civil conflict in the oil-exporting state.

3.6 Research Design

The general expectation of this study is that prewar intervention is more likely to occur in an oil-exporting state and the onset of civil war is less likely to occur in an oil-exporting state with external support for its government. The unit of analysis is country-year for all states from 1986 to 2007. This study examines prewar intervention using the data on prewar interventions developed by Regan and Meachum (2014) and civil war onset using the Uppsala/Peace Research Institute of Oslo (PRIO) dataset. First, prewar intervention is a third-party action prior to civil conflict that is a policy beyond foreign economic or military aid and is targeted at the authority structures within a state (Regan 1996). In order to distinguish

prewar intervention from other kinds of intervention, Regan and Meachum (2014) use a risk score of Goldstone et al. (2010), which indicates the likelihood that a state will experience a civil war onset within two years and is calculated by a state's regime type, infant mortality, the presence of a conflict-prone neighborhood, and state-led discrimination. If an external actor militarily, economically, or diplomatically intervenes in a state where the risk score is higher than 0.3 but does not experience civil conflict yet, this intervention would be a prewar intervention case.

In order to test hypotheses, I classify prewar intervention cases of Regan and Meachum's (2014) dataset into three types: support for the government side, neutral intervention, and support for the rebel side. I refer to the measure of prewar interventions as *Intervention* (3.34% of all country-years), the measure of support for the government side as *Government* (1.00% of all country-years), the measure of neutral interventions as *Neutral* (1.75% of all country-years), and the measure of support for the rebel side as *Rebel* (1.52% of all country-years). All prewar intervention measures are coded as dichotomous variables that take the value one in the year that a state experiences a prewar intervention and zero otherwise. The dataset covers 163 states with populations exceeding 500,000, which results in 3,461 country-year observations.

Second, civil war onset is a dichotomous variable that equals 1 only for country-year observations that experienced the initiation of fighting between a government and domestic opponents that would result in at least 25 battle deaths (Gleditsch et al. 2002), and zero otherwise. I refer to this measure as *Onset*. This dataset covers 163 states with populations exceeding 500,000, which includes 3,461 country-year observations.

Because the dependent variables are binary, I use the logistic regression to examine the hypotheses. Standard errors are clustered by state to account for potential unobserved state-level heterogeneity. To control for temporal dependence, I include a variable counting the number of years without a civil war with the cubic polynomial approximation (Carter and Signorino 2010). All

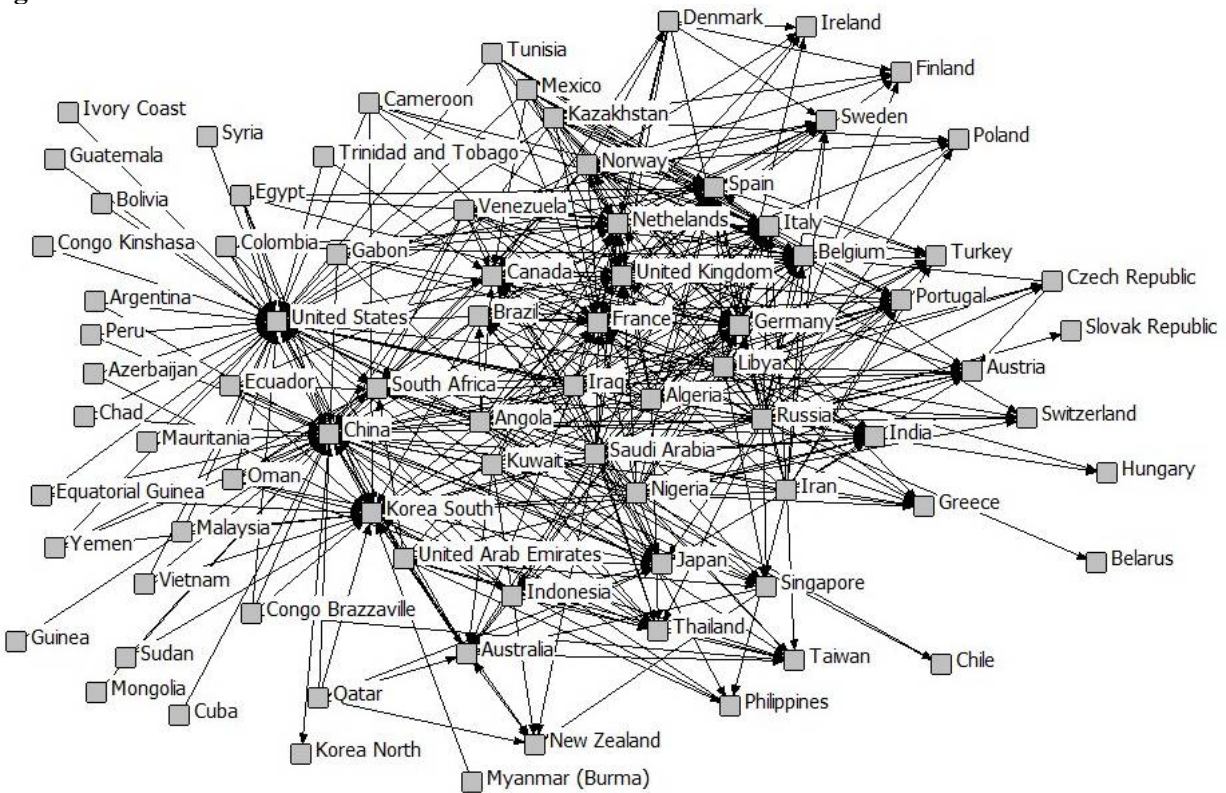
independent variables are lagged one year to avoid endogeneity problems.

3.6.1 Oil Trade Network and Network Centrality

In order to specify the influence of a state's oil trade ties on prewar intervention and civil war onset, three components of trade should be considered: *depth*, *breadth*, and *closeness*.¹⁵ First, the depth of a state's oil trade ties captures the total oil export amount of its oil trade ties. The key issue that depth captures is costs of breaking an oil trade tie. Even if a state exports oil to other states, if the state does not export a substantial amount of oil to them, its oil trade ties would not attract external support from them. Second, the breadth of a state's oil trade ties is its number of oil trade partners. This captures the mechanism by which an oil-exporting state's oil trade ties act as strategic tools to attract prewar interventions. As the state exports oil to more states, it is increasingly likely that one or more of the oil-importing states will intervene. Third, the closeness of a state's oil trade ties captures the level of its oil trade proximity to all other states, including states that it does not trade oil with directly. This component emphasizes the indirect role that oil trade ties can play in the international oil market. In 2012, for example, Russia did not export oil to Chile. Yet, Chile imported oil from the United Kingdom, which is one of Russia's oil importers. Although Chile does not have a direct oil trade tie with Russia, the break of the oil trade tie between United Kingdom and Russia can affect the United Kingdom's oil reserves and, ultimately, its oil export to Chile. This implies that an oil-exporting state's oil trade ties can affect many states, including those with which it does not have a direct oil trade tie.

¹⁵ These three components are similar to Kinne's (2012) measures for trade integration. Instead of capturing these general trade patterns, however, I use these measures to capture an exporter's ability to attract prewar intervention due to the export-favored structure of the international oil market and the importance of oil.

Figure 3-1. The Structure of the Oil Trade Network in 2007.



Note: This figure illustrates the structure of the oil network. Each square indicates a state in the oil network, and each arrow shows the oil trade relation between two countries. The direction of each arrow indicates the flow of oil from an exporter to an importer. Squares and arrows do not indicate geographical characteristics.

In order to capture the influence of these three components on prewar intervention and the onset of civil war, I employ network analysis, specifically closeness centrality in weighted networks. In network analysis, a network consists of a set of nodes (e.g., people, institutions, states) connected by a set of edges (e.g., friendship, alliance, trade) (Maoz 2009). Because a state's oil trade ties in the international oil market are affected by other states' oil trade ties, oil trade ties are one kind of interaction among states. Thus, the international oil market is a network comprised of states (nodes) and their oil trade ties (edges). The network is formally represented as an $n \times n$ adjacency matrix where matrix entries x_{ij} indicate a tie between node i and node j . As stated above, because oil export is more influential in the international oil market than oil import, oil trade ties are *directed*, or $x_{ij} \neq x_{ji}$. I define an oil trade tie from i to j as a tie

weighted by metric tons of oil that state i exports to state j . The oil trade ties are estimated by numerous oil trade datasets (see Online Appendix A). For a given year, the international oil trade network is represented as adjacency matrix \mathbf{X} , which captures the totality of the oil trade network and indicates who trades oil with whom and at what levels. Based on these data, the oil trade network consists of 163 independent states and their oil trade ties with other states. Figure 3-1 is a sociogram of the oil trade network in 2007 that reveals the structure and flows of oil trade ties. In Figure 3-1, a node is a state, and an arrow is an oil trade tie indicating the direction of oil trade from an exporter to an importer. If a node has many arrows, the node would be considered a major oil-importing or -exporting state.

This study focuses on actor centrality, a network property associated with power and prestige of each node in a network (Borgatti 2005). Generally, substantive interpretation of centrality depends on the substance of the network. The arguments of the previous section suggest that an oil trade tie may be a source of an oil-exporting state's ability to affect other states' policy decisions. That is, a central oil-exporting state in the oil trade network may easily attract prewar interventions from other states. In order to capture this, comprised of three components (depth, breadth, and closeness), I employ *weighted closeness* centrality (Opsahl, Agneessens, and Skvoretz 2010).

First, the depth of a state's oil trade ties is the sum value of a state's oil trade ties,

$$V_i = \sum_{j=1}^n x_{ij} \quad (i \neq j) \quad (1)$$

where x_{ij} denotes entries of the weighted oil trade network, \mathbf{X} . Because the value of an oil trade tie is defined as its oil export amount (metric tons), V_i is the total oil amount that state i exports.

Second, the breadth of a state's oil trade ties is identical to the total number of a state's oil trade partners in the oil trade network, \mathbf{X} , called *degree centrality*. Formally, the degree centrality ($C_D(i)$) is calculated by the following formula:

$$C_D(i) = \sum_{j=1}^n a_{ij} \quad (i \neq j) \quad (2)$$

where a_{ij} is the oil trade tie between states i and j ($a_{ij} = 1$ if i trades with j and 0 otherwise), and n is the number of states in the oil trade network (Borgatti 2005). As stated above, because oil trade ties are directed, degree centrality is classified into two indices: out-degree centrality (the number of oil export ties) and in-degree centrality (the number of oil import ties). However, because I focus on the ability of oil-exporting states to attract prewar intervention, only out-degree centrality is applicable to this study.

Third, the closeness of a state's oil trade ties identifies the sum of geodesic distances from the state to all others, defined as number of links in the shortest path between two nodes, called *closeness centrality* (Borgatti 2005). For example, if two states are immediately connected with each other, their geodesic distance is one. If the geodesic distance between state a and another state b is two, state a exports (or imports) oil to (or from) state c and the state c exports (or imports) oil to (or from) state b . The geodesic distance between i and j is calculated by the following formula:

$$d(i, j) = \min(a_{ih} + \dots + a_{hj}) \quad (3)$$

where, h are intermediary nodes on paths between node i and j . The closeness centrality ($C_c(i)$) is calculated by the following formula:

$$C_c(i) = \left[\sum_{j=1}^n d(i, j) \right]^{-1} \quad (i \neq j) \quad (4)$$

where $d(i, j)$ is the distance between states i and j . Because oil trade ties in the oil trade network are directed, only out-closeness centrality is applicable to this study. However, the closeness centrality includes breadth and closeness, but ignores depth.

In order to combine these three components, I use closeness centrality in weighted networks

(Opsahl, Agneessens, and Skvoretz 2010). This index uses a tuning parameter, α , that weights the shortest paths by the depth of a state’s oil trade ties, and defines the geodesic distance between i and j as

$$d^w(i, j) = \min \left(\frac{1}{x_{ih}^\alpha} + \dots + \frac{1}{x_{hj}^\alpha} \right) \quad (5)$$

where, as before, h represents intermediate nodes. In equation (5), the value of α must be determined by theory (Kinne 2012). If $\alpha = 0$, $d^w(i, j)$ is equal to the minimum number of nodes between i and j , as the geodesic distance calculation from equation (3). The increase in the value of α favors stronger over weaker paths (Kinne 2012). Based on equation (5), Opsahl, Agneessens, and Skvoretz (2010) define closeness centrality in weighted networks as

$$C_c^w(i) = \left[\sum_{j=1}^n d^w(i, j) \right]^{-1} \quad (i \neq j). \quad (6).$$

Because oil trade ties in the oil trade network are directed, I use only out-closeness centrality in weighted networks to estimate the ability of oil-exporting states to attract prewar interventions. To balance three components, I set α at 0.5.¹⁶ I refer to this measure as *Weighted Closeness*.¹⁷ Figure 3-2 illustrates oil trade centrality levels across the world for the year 2007.

¹⁶ When $\alpha > 1$, the impact of additional intermediary nodes is relatively unimportant compared to the depth of ties and paths with more intermediaries, which is inconsistent with the logic of oil trade relationships. Also, while the depth of ties is ignored ($C_c^w(i) = C_c(i)$) when $\alpha = 0$, the breadth of ties is ignored $\alpha = 1$. Because of these characteristics of α , Kinne (2012) also set $\alpha = 0.5$ to capture the degree of trade integration.

¹⁷ *Weighted Closeness* is calculated by “tnet” package (Opsahl 2009) in R 3.1 (R development Core Team 2014).

Figure 3-2. The Pattern between Centralities and Democracy in Autocratic Oil exporters.



Note: Darker shading indicates greater oil trade centrality. Centrality scores calculated using C_e^w for directed weighted networks ($\alpha = 0.5$). Based on data from year 2007.

3.6.2 Control Variables

I include variables considered in past studies as important causes of civil war onset as control variables to isolate the effects of my primary independent variables on both prewar intervention and civil war onset, because interventions are based on the expected probability of civil war onset. The first control variable is *Oil Discoveries*, which measures the natural log of oil reserves in year t subtracted by reserves estimated for year $t - 1$, drawn from Bell and Wolford's (2014) data. Generally, oil revenues are immobile and non-taxed sources of income that radically increase the government's power over potential challengers (Ross 2001; Smith 2004). That is, recently discovered oil reserves significantly alter the government's and the rebel side's expectations about the future power distribution between them, and might make the rebel side fear for the future. This fear may increase the likelihood of civil conflict (Bell and Wolford 2014).

The second control variable is *GDP/capita*, which measures the natural log of GDP per capita based on data from Gleditsch (2002b). Generally, wealthier states have a lower likelihood of civil war onset because they have more resources to invest in either repressing or appeasing dissent (Fearon and Laitin 2003). The third control variable is *XPolity*, which measures the level of democracy for conflict studies by removing the constituent terms of the index that are endogenous to political violence (Vreeland

2008). The fourth control variable is *Institutional Durability*, which counts the logged number of years that have passed since government institutions were replaced or reformed to the extent of a change in the Polity Index score of at least three points. I also consider factors that offer rebels a military advantage versus the state by controlling for *Mountainous Terrain* (Fearon and Laitin 2003), *Ethnic and Religious Fractionalization* (Alesina et al. 2003), and the logged *Population* size (World Bank 2013). Finally, I employ two factors, the number of *Alliances* (Gibler 2009) and the number of *Contiguous States* (Stinnett et al. 2002), that could affect third parties' prewar intervention decisions. Findley and Teo (2006) argued that a potential intervener is likely to support the government to protect their convergent interests if it is allied with the government. Regan (2000) argued that interventions in ongoing civil conflicts are more likely when there are a greater number of contiguous states. However, these two variables are excluded from the analysis of civil war onset.

3.7 Oil Trade Ties and Prewar Intervention

I begin by examining the influence of *Weighted Closeness* on prewar intervention in Table 3-1. All models can be interpreted similarly with positive coefficients indicating that prewar intervention becomes more likely as independent variable increases. In Table 3-1, the dependent variables are *Intervention*, *Government*, *Neutral*, and *Rebel*. Each model in table 3-1 includes one dependent variable and independent and control variables to examine each hypothesis.

Although the coefficient of the independent variable in Model 2 in Table 3-1 is positive and statistically significant, coefficients of the independent variable in other models in Table 3-1 are not statistically significant. These results reveal that an oil-exporting state's oil trade ties rarely affect the likelihood of prewar intervention, neutral intervention, and external support for the rebel side, and do not support the first, third, and fourth hypotheses. However, empirical results in Model 2 support the second hypothesis that external support for the government side is more likely as the effect of an oil-exporting state's oil trade ties on the entire oil trade market increases.

Table 3-1. The Oil Trade Network Centrality and Prewar Intervention, 1986-2007.

	Model 1 (All interv.)	Model 2 (Gov. interv.)	Model 3 (Neutral interv.)	Model 4 (Rebel interv.)
<i>Weighted Closeness</i>	0.033 (0.018)	0.055* (0.023)	0.005 (0.036)	0.024 (0.016)
<i>Oil Discoveries (log)</i>	-1.382 (1.569)	-3.705 (3.339)	-8.099 (7.313)	-0.666 (1.504)
<i>GDP per capita (log)</i>	-0.545* (0.229)	-0.377 (0.302)	-0.764** (0.293)	-0.214 (0.330)
<i>XPolity</i>	-0.027 (0.058)	-0.022 (0.093)	0.017 (0.082)	-0.138 (0.093)
<i>Inst. Durable</i>	-0.441** (0.154)	-0.465* (0.210)	-0.562** (0.203)	-0.267 (0.239)
<i>Mountainous</i>	-0.048 (0.120)	0.008 (0.176)	-0.140 (0.165)	-0.041 (0.172)
<i>Ethnic Frac.</i>	0.697 (0.801)	-0.296 (0.972)	0.527 (0.951)	1.601** (0.742)
<i>Religious Frac.</i>	-0.696 (0.987)	1.650 (1.596)	-0.233 (1.407)	-0.136 (1.044)
<i>Population (log)</i>	0.071 (0.135)	-0.030 (0.220)	-0.116 (0.222)	0.406** (0.180)
<i>Alliances</i>	-0.007 (0.014)	-0.026 (0.021)	0.011 (0.018)	-0.017 (0.021)
<i>Contiguous States</i>	0.040 (0.058)	0.040 (0.062)	0.040 (0.089)	-0.039 (0.069)
<i>Constant</i>	0.725 (2.597)	-0.443 (3.801)	3.892 (3.456)	-6.478** (3.257)
<i>N</i>	2,693	2,693	2,693	2,693
<i>N_{States}</i>	143	143	143	143
Wald chi2	97.48***	90.29***	76.53***	101.5***
Hosmer-Lemeshow chi2	13.27	5.95	14.47	12.08
ROC	0.809	0.841	0.867	0.813

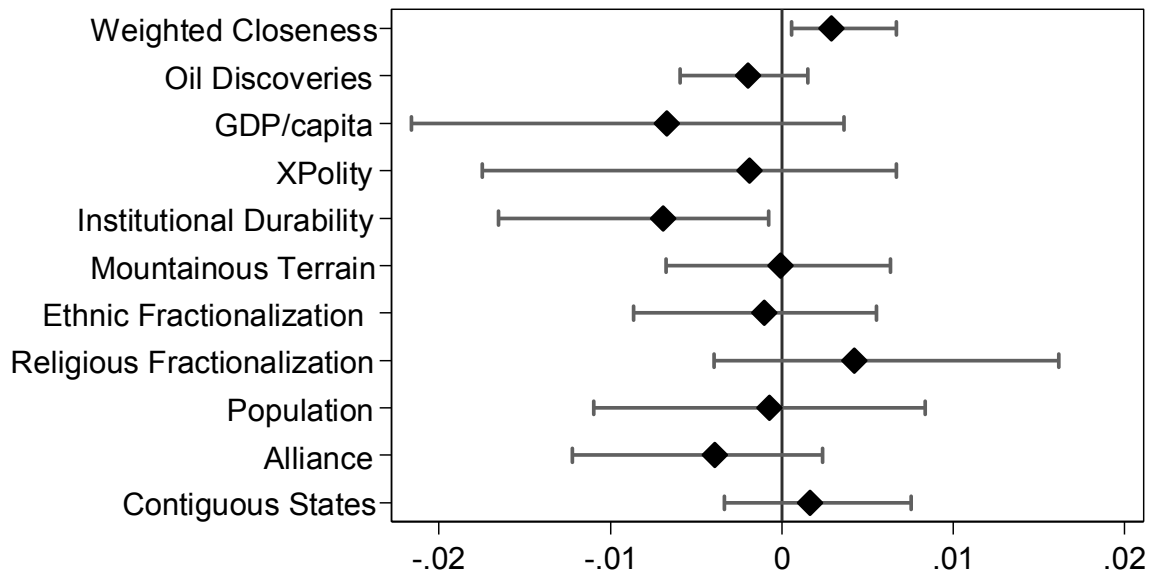
*p<.05, **p<.01, ***p<.001 (two-tailed).

^aCell entries report coefficients and cluster-corrected standard errors (in parentheses) from logistic regressions. Peace years not shown.

Beyond statistical significance, I calculate each variable's marginal effect on the dependent variable in Table 3-1 using the *Clarify* program (King, Tomz, and Wittenberg 2000; Tomz, Wittenberg, and King 2003). The results for these calculations with Model 2 are graphically presented in Figure 3-3. Figure 3-3 displays how we should expect the likelihood of external support for the government to vary when *Weighted Closeness* and each control variable is allowed to vary from its 10th to 90th percentile while holding all other variables constant (means). In substantive terms, the influence of an oil-exporting

state's oil trade ties on external support for its government is considerable. If a state does not export oil to other states, the likelihood of external support for the government side is around .0036. However, if a state has "11" *Weighted Closeness in the international oil trade network*, such as Angola and Egypt, the likelihood of external support for its government would jump to .0065, which represents around 81.4% increase. This result supports the second hypothesis.

Figure 3-3. The Effect of Weighted Closeness on Probability of Prewar Intervention, 1986-2007: Substantive Effects.



Note: Values reveal first difference (FD) estimations (♦) with 95% confidence intervals (|-|). Estimations come from Table 3-1, Model 2.

Regarding the control variables, coefficients of some control variables are negative and statistically significant. First, states are around 83.9% (.0481-.0077) less likely to experience prewar intervention, and are around 92.8% (.0218-.0016) less likely to experience neutral intervention, as their *GDP/capita* varies from its 10th to 90th percentile. However, *GDP/capita* does not significantly affect the likelihood of external support for either the government or rebels. This implies that the increase in a state's capability to invest in either repressing or appeasing dissent discourages third parties to neutrally intervene in the state but rarely affect their decisions to support its government or its rebels. Because most neutral prewar interventions are humanitarian interventions to prevent civil conflict, neutral interventions

might not be required if a state has sufficient capabilities to stabilize its domestic society. However, because external support for either the government or rebel groups depend on their expected benefits that might not be related with the target state's level of wealth, *GDP/capita* does not significantly affect the likelihood of external support for the government or rebels. Second, results for *Institutional Durability* provide additional evidences about the likelihood of prewar intervention. A move from the 10th to 90th percentile in this measure decreases the likelihood of prewar intervention by around 72.3% (.0353-.0098), the likelihood of external support for the government by around 74.6% (.0091-.0023), and the likelihood of neutral prewar intervention by around 81.1% (.0126-.0024). This implies that third parties are less likely to intervene in a state whose political institutions are stable to resolve its political problem and prevent civil war. Third, coefficients of *Ethnic Fractionalization* and *Population* in Model 4 are positive and statistically significant. In substantive terms, a move from the 10th to 90th percentile in *Ethnic Fractionalization* increases the likelihood of external support for rebels by 203.6% (.0042-.0127). A move from the 10th to 90th percentile in *Population* also increases the likelihood of external support for rebels by 352.6% (.0035-.0159). This implies that greedy third parties are likely to support rebels in a state with better conditions to mobilize to foster civil war onset. Other control variables do not have statistically significant effects on the dependent variables.

Finally, I ran tests for model fit. In addition to the common Wald's chi-squared statistics, which are significant at $<.001$ for all models, I include Hosmer and Lemeshow (2000) and Receiver Operating Characteristic (ROC) curve analyses (King and Zeng 2001). The Hosmer-Lemeshow test divides subjects into deciles based on predicted probabilities and then computes a chi-squared test between observed and predicted values of the dependent variables between each group with the null hypothesis that groups are similar. Each of these tests is insignificant, indicating that the models fit the data well. The ROC curve calculates the true-positive rate against the false-positive rate for all possible cutpoints (ranging from 0 to

1). The ROC value of each model ranges from .809 to .867, indicating a fair/good model fit. These results suggest that a state's oil trade ties should be considered to predict the likelihood of prewar intervention.

Table 3-2. The Oil Trade Network Centrality and Onset of Civil War, 1986-2007.

	Model 5 (Full sample)	Model 6 (Full Sample)	Model 7 (Interaction)
<i>Weighted Closeness</i>	0.026* (0.012)	0.027* (0.012)	0.030* (0.012)
<i>Intervention</i>	1.060* (0.422)		
<i>Government</i>		0.689 (0.680)	1.684** (0.566)
<i>Weighted Closeness</i> × <i>Government</i>			-0.151* (0.074)
<i>Neutral</i>		1.589** (0.471)	1.333** (0.486)
<i>Rebel</i>		0.294 (0.574)	0.295 (0.547)
<i>Oil Discoveries (log)</i>	-0.755 (0.930)	-0.701 (0.908)	-0.763 (0.954)
<i>GDP per capita (log)</i>	-0.264 (0.143)	-0.238 (0.142)	-0.233 (0.144)
<i>XPolity</i>	0.006 (0.030)	0.000 (0.029)	0.001 (0.028)
<i>Inst. Durable</i>	0.034 (0.107)	0.046 (0.108)	0.054 (0.108)
<i>Mountainous</i>	0.005 (0.094)	0.019 (0.098)	0.021 (0.099)
<i>Ethnic Frac.</i>	1.610** (0.575)	1.690** (0.584)	1.823** (0.602)
<i>Religious Frac.</i>	-1.107 (0.689)	-1.194 (0.685)	-1.341 (0.707)
<i>Population (log)</i>	0.288** (0.089)	0.302** (0.088)	0.304*** (0.087)
<i>Constant</i>	-4.229** (1.385)	-4.728** (1.387)	-4.896*** (1.397)
<i>N</i>	2,693	2,693	2,693
<i>N_{States}</i>	143	143	143
Wald chi2	106.8***	110.4***	95.05***
Hosmer-Lemeshow chi2	7.21	11.27	11.16
ROC	0.802	0.805	0.808

*p<.05, **p<.01, ***p<.001 (two-tailed).

^aCell entries report coefficients and cluster-corrected standard errors (in parentheses) from logistic regressions. Peace years not shown.

3.8 Oil Trade Ties and the Onset of Civil War

Table 3-2 presents the estimates of three models of civil war onset, including baseline logit models of civil war onset (Models 5 and 6) and a model that tests conditional hypotheses (*H5* and *H6*) (Model 7). All models can be interpreted similarly with positive coefficients indicating that onset of civil war becomes more likely as independent variable increases. In Table 3-2, the dependent variable is *Onset*. Each model in Table 3-2 includes one dependent variable and independent and control variables to examine each hypothesis. The prewar intervention variables, *Government*, *Neutral*, and *Rebel*, are included to control influences of prewar intervention on civil war onset.

Model 7 in Table 3-2 supports the fifth hypothesis, which the effect of *Weighted Closeness* on civil war onset depends upon external support for the government, and the sixth hypothesis, which the effect of external support for the government on civil war onset depends on the level of a state's *Weighted Closeness*. The marginal effects of the independent and control variables are gauged by the *Clarify* program (King, Tomz, and Wittenberg 2000; Tomz, Wittenberg, and King 2003), and reveals how we should expect the likelihood of civil war onset to vary when independent and control variables are allowed to vary from its 10th percentile to 90th percentile for continuous variables and from 0 to 1 for dichotomous variables while holding all other variables constant (means and modes).

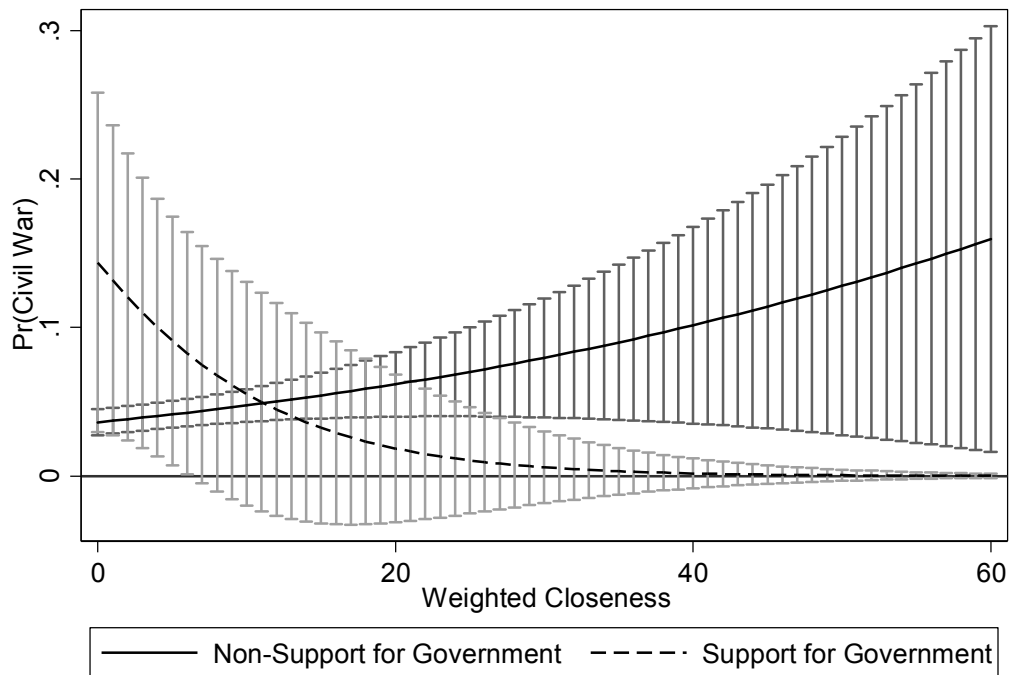
In substantive terms, the effect of *Weighted Closeness* on civil war onset is considerable. In Model 7, if a state does not export oil to other states, the likelihood of civil conflict is around .0190. However, if a state's *Weighted Closeness* is "11", such as Angola and Egypt, the likelihood of civil war jumps to around .0263, which represents around a 37.6% increase. However, in Figure 3-4 (a), if an oil-exporting state experiences external support for its government, the increase in *Weighted Closeness* decreases the likelihood of civil war. This supports the initial expectation that external support for oil-exporting state's government makes both the government and rebels certain that oil-importing states may intervene in the exporter to protect their oil trade ties. However, the absence of external support for the

government may cause information problems that increase the likelihood of civil war onset, because rebels generally have incomplete information about its oil trade ties and, thus, might miscalculate the likelihood of external support for the government. This supports the fifth hypothesis.

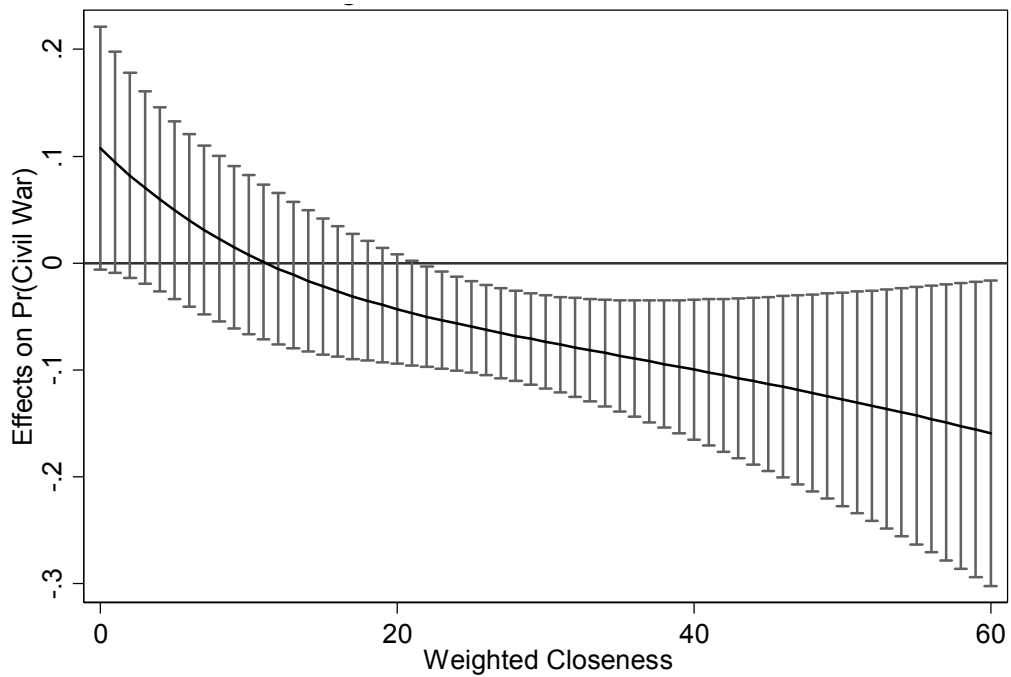
In addition, Figure 3-4 (b) reveals that increase in *Weighted Closeness* changes the effect of external support for the government on the likelihood of civil war onset. In Figure 3-4 (b), if an oil-exporting state has the lower level of *Weighted Closeness* than 20, external support for the government does not have the statistically significant effect on the likelihood of civil war onset. However, if an oil-exporting state has the higher level of *Weighted Closeness* than 20, external support for the government is likely to hinder civil war onset. This reveals that external support for an oil-exporting state's government is likely to reduce information problems generated by oil trade ties, and supports the sixth hypothesis.

Figure 3-4. Marginal Effect of Weighted Closeness on Probability of Civil War Onset, 1986-2007.

(a) Conditional Marginal Effects of *Weighted Closeness* on Civil War with 95% CIs



(b) Conditional Marginal Effects of *Government* on Civil War with 95% CIs



Regarding the control variables, in Models 7 we first see that having an experience with neutral prewar intervention increases the likelihood of civil war by around 297.0% (.0211-.0839). This reveals that although third parties may neutrally intervene in an oil-exporting state to prevent civil war, the intervention increases the likelihood of civil war onset. Prior studies on third-party intervention and civil war duration have argued that third parties as veto players are likely to reduce the bargaining range and aggravate information problems (Cunningham 2006) because third parties, who bear lower costs of fighting and anticipate gaining less benefit from negotiation than the internal actors, generally have less incentive to cease civil war and negotiate than internal actors (Cunningham 2010). This implies that neutral prewar intervention also is likely to introduce veto players who can reduce the bargaining range and causes information problems rather than to reduce the likelihood of civil war onset. Second, in Models 7, coefficients of *Ethnic Fractionalization* and *Population* support previous studies' arguments that the higher level of ethnic fractionalization and the larger size of population increases the number of potential recruits to an insurgency, and, thus, increases the likelihood of civil war onset (Fearon and Laitin 2003; Smith 2004). States are around 256.3% (.0113-.0402) more likely to experience civil war onset as *Ethnic Fractionalization* varies from its 10th to 90th percentile. A move from the 10th to 90th percentile (7.15-11.15, ln values) in *Population* also increases the likelihood of civil war by around 216.7% (.0119-.0376). However, other control variables are not statistically significant. Finally, each models' Hosmer and Lemeshow chi-squared values in Table 3-2 are insignificant, indicating that the models fit the data well, and their ROC values range from .802 to .808, indicating a fair/good model fit. This suggests that a state's oil trade ties and external support for the government side should be considered to predict the likelihood of civil war onset.

3.9 Conclusion

This study explores the effect of an oil-exporting state's oil trade ties on prewar intervention and civil war onset. The research on oil and civil war has little dealt with oil as a strategic tool that affects importing states' decision-making. I argue that an oil-exporting state's oil trade ties are likely to attract external support for its government because oil-importing states try to avoid the break of their oil trade ties caused by civil war onset. I also argue that the effect of an oil-exporting state's oil trade ties on civil war onset depends on external support for its government. That is, the absence of external support for an oil-exporting state's government may cause the bargaining failure between the government and rebels, because rebels with incomplete information about its oil trade ties might miscalculate the likelihood of external support for the government and an acceptable bargaining range. However, external support for an oil-exporting state's government makes the government and rebels certain that oil-importing states may support the government to protect their oil trade ties, and, thus, reduces the likelihood of civil war caused by the bargaining failure.

In order to analyze these arguments, I decompose the influence of oil trade ties into three components (depth, breadth, and closeness), and estimate how an oil-exporting state's oil trade ties affect prewar intervention and civil war onset with closeness centrality in weighted networks. The empirical results provide two implications. First, an oil-exporting state's oil trade ties are likely to encourage oil-importing states to support its government. That is, to avoid the break of oil trade ties, as the effect of an oil-exporting state's oil trade ties on the international oil market increases, oil-importing states are more likely to support its government to stabilize the exporter. However, oil-exporting states' oil trade ties rarely affect third parties' support for rebels and neutral prewar intervention. Second, the effect of an oil-exporting state's oil trade ties on the likelihood of civil war onset depends on external support for its government. External support for an oil-exporting state's government reduces information problems caused by rebel's incomplete information about the government's oil trade ties. However, the increase in

the effect of an oil-exporting state's oil trade ties on the international oil market without external support for its government is likely to cause information problems and, thus, increase the likelihood of civil war.

This research provides three implications. First, the effect of oil on civil war is more complicated than what prior studies have dealt with. Although prior studies have focused on the effect of oil on domestic actors, including the government and rebels, this study reveals that oil can affect decisions of potential interveners who can affect the likelihood of civil war onset. This also reveals why empirical results of prior studies have not consistently revealed the effect of oil on civil war onset. This implies that we should consider the effect of oil on both domestic and international actors. Second, this research reveals that trade ties can affect conflict onset, but their effect on conflict onset depends on what products a state export to and/or import from other states. I argue that the structure of the international oil market and the importance of oil as a primary energy source increase the ability of an oil-exporting state to attract external support. However, if a state exports strategically or economically less important products, such as toys, to other states, its trade ties rarely cause high exit costs and provide leverage over its trade partners. Thus, to analyze the effect of trade ties on conflict, we should focus on what a state export to and/or import from other states. Finally, this study suggests that energy policies can be important factors of international relations. An oil-exporting state's ability to attract external support is derived from the exporter-favored structure of the international oil market and the importance of oil as a primary energy source. This implies that an oil-exporting state's ability to attract external support would be reduced due to oil-importing states' renewable energy development policies that may both allow the importers to avoid the exporter-favored market structure and reduce the importance of oil as a primary energy source.

4. Oil and Coup Risk

4.1 The Puzzle and Purpose

A large literature on the oil curse theory focuses on how oil affects democratization, regime failure, and civil war onset (e.g., Ross 2001; de Soysa 2002; Fearon and Laitin 2003; Smith 2004; Humphreys 2005; Ross 2009; Haber and Menaldo 2011; Wright, Frantz, and Geddes 2014). However, because prior studies have not fully specified the effect of oil, they suggest two contrasting arguments: oil helps perpetuate autocratic regimes, but increases the likelihood of civil war onset. Thus, empirical results have revealed that oil both improves and weakens political stability. I argue that the effect of oil should be more carefully specified. In order to specify the effect of oil on political stability, I classify the effect of oil into three aspects: the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. I focus on how these three aspects affect *coups d'état*. Prior studies on the oil curse theory rarely focus on coup risk, which is one type of political phenomena that can reveal the political instability of a regime. *Coup d'état* is defined as “illegal and overt attempts by the military or other elites within the state apparatus to unseat the sitting executive” (Powell and Thyne 2011, 252). Generally, *coups d'état* have been understood as the result of political instability (Marinov and Goemans 2013). Thus, a study on the relationship between oil and coup risk can closely capture how oil affects political instability. In addition, because a *coup d'état* is an illegal attempt that weakens political stability, this study can also shed light on how oil affects both legal and illegal attempts that weaken political stability of oil-producing regimes.

I argue that each aspect of oil has different effects on a coup attempt. First, oil revenues are likely to reduce coup risk. Because oil revenues allow political leaders to spend money to dampen social grievances and to invest in repressive apparatuses, they may avoid the decrease in legitimacy and reduce potential coup plotters' ability to stage a coup. Second, oil reserves increase the likelihood of a coup

attempt. As prior studies on the relationship oil and civil war argued, oil reserves are likely to increase the value of capturing a state and attract greedy third parties to intervene in the state (Humphreys 2005). Thus, oil reserves may increase the anticipated payoff of a coup success, and may encourage potential coup plotters to stage a coup. Third, a state's oil trade ties are likely to reduce coup risk. Because oil is a primary energy source in most states but only a few states can produce and export it, the break of oil trade ties is likely to damage oil-importing states' economies more than oil-exporting states' ones. Thus, if an oil-exporting state has a political instability problem that may cause a break of its oil trade ties, oil-importing states are likely to intervene in the state to resolve the problem and protect their oil trade ties. This implies that an oil-exporting state's oil trade ties are strategic tools to obtain support for its government from oil-importing states. Likewise, the possibility of external support may decrease potential coup plotters' perceived probability of a coup's success.

In order to test my expectations, I measure the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. First, the effect of oil revenues is measured by oil income per capita. I estimate oil income per capita as the total value of crude oil production per person, and multiplied by the real world price. Second, crude oil reserves for all states is measured by using the United States Energy Information Agency (EIA) data (U.S. Energy Information Agency 2015a). Third, the effect of a state's oil trade ties is measured by a social network approach, focusing on the concept of network centrality. In network research, the centrality index indicates the level of each state's influence on the international oil market and each state's ability to attract oil-importing states' support to avoid a coup. The centrality index captures three components of oil trade ties: the depth of a state's oil trade ties (the total oil amount for a state's oil trade ties), the breadth of a state's oil trade ties (a state's number of oil trade partners), and the closeness of oil trade ties (the level of a state's oil trade proximity to all other states). Each component specifies how oil trade ties reduce coup risk.

The remainder of this paper is organized as follows. In the first section, a brief review of the

literature on determinants of coups d'état reveals that coup risk depends on two kinds of causes: expected payoffs from a coup, including legitimacy of the regime and organizational interests of coup plotters, and perceived probability of success. In the second section, I specify effects of oil on political instability, and develop a theoretical framework to study the relationship between oil and coup risk. Effects of oil on coup risk are decomposed into three components: the effect of oil reserves, the effect of oil revenues, and the effect of oil trade ties. I specify how each component affects the expected payoff from a coup and perceived probability of success. The third section examines how three components of oil affect coup risk. In the final section, I discuss the implications of the results.

4.2 Oil and Political Stability

Prior studies have suggested four causal explanations about the effect of oil on political stability: the rentier state effect, the repression effect, the rent-seeking effect, and the weak state effect. The former two theories suggest that oil is likely to improve political stability of autocratic regimes, while the latter two theories argue that oil is may weaken political stability of regimes by increasing the likelihood of civil war onset. First, the rentier effect theory argues that regimes that do not rely on domestic extraction (i.e., taxes) for the bulk of their revenue are more likely to be stable autocracies (Najmabadi 1987). An oil-funded government is likely to be a distributive state rather than an extractive state because of the exceptional size of oil revenues from state assets (Delacroix 1980). Because oil radically increases government finances, oil-rich governments do not have to be concerned with societal interests to extract their operating revenues. This is referred to as the “taxation effect” (Najmabadi 1987; Ross 2001). Oil revenues also allow for more social spending in dictatorships, which lowers social grievances and dampens latent democratizing pressures, called as the “spending effect” (Kessler 1999). However, because world oil prices are volatile, government finances depending on oil revenues are likely to be unstable (Ross 2013). If governments make information about oil revenues known to the public,

therefore, political leaders' incompetence might be discovered. However, information about oil revenues is easily concealed because the oil industry is managed by the relationship between host governments and foreign oil companies or by state-owned oil companies. In autocratic states, we do not see institutions that force the government to make information about oil revenues known to the public, making it easy for political leaders to conceal this information. In this process, political leaders can satisfy their greed. This implies that political leaders in oil-funded governments have a strong incentive to remain autocratic, enabling them to maintain power and hide their incompetence and greed from the public. In sum, oil revenues are likely to increase political stability of autocratic regimes by decreasing tax rates and by increasing social spending.

Second, the repression effect theory argues that oil revenues allow a state to invest in repressive apparatuses that can oppress social opposition and keep political leaders in power (Ross 2001). Empirical analysis of prior studies suggested that oil wealth is correlated with military spending, which is one of important factors to improve repressive apparatuses (e.g. Ross 2001). In addition, because superpowers are interested in access to oil and are less likely to intervene in domestic politics of oil-funded states, the investment in repressive apparatuses of oil-funded states' political leaders depends mostly on the leaders' ability and will to repress, called as the "robustness of authoritarianism" (Bellin 2004). Therefore, oil revenues bolster political stability of an autocratic regime by funding repressive apparatuses.

Third, a large number of studies have suggested two mechanisms, *the grievance mechanism* and *the greedy rebel mechanism*, to explain the influence of oil on civil war onset. The grievance mechanism argues that resource extraction may generate grievances among the local population, which provides the fuel for rebel mobilization through forced migration (Ross 2004; Humphreys 2005). For example, logging or mining firms may expropriate land from people, deprive them of any benefits from the land, or cause environment damages, such as the extraction process in Ache and Papua New Guinea (Gedicks 2001; Klare 2001). Labor migration in these processes causes insufficient job opportunities in the region, social

disruptions, and unjust resource wealth distribution, such as in Sierra Leone, Nigeria, Niger, and Chad (Humphreys 2005). Also, the vulnerability of economies depending on natural resource revenues to trade shocks and wealth redistribution might generate grievances. These grievances then facilitate rebel mobilization.

The greedy rebel mechanism argues that natural resources are financial sources that allow rebel leaders to mobilize and organize to challenge government forces (Collier and Hoeffler 2004; Ross 2004; Humphreys 2005). Rebel leaders raise money both by selling natural resources and selling “booty futures” (Ross 2004; Humphreys 2005). That is, rebels in regions with natural resources more easily fund the start-up costs of initiating a rebellion (Collier and Hoeffler 2004; Ross 2004). In addition, if natural resources are concentrated in a particular region in a state, the local population in the region may believe that a seceding state is viable and even prosperous (Ross 2004). This implies that natural resources increase the economic value of capturing the state or seceding, such as in Colombia, Chad, or the Republic of Congo (Fearon and Laitin 2003; Collier and Hoeffler 2004). In sum, these two mechanisms suggest that oil is likely to reduce political stability by increasing the likelihood of rebel mobilization.

Fourth, some prior studies on oil and civil war onset have focused on how oil affects state apparatuses. They have argued that oil-funded states tend to have weaker state apparatuses because they rely less on “a socially intrusive and elaborate bureaucratic system” to raise tax revenues (*the weak states mechanism*). In other words, oil revenues allow governments to rely less on state-society linkages and be less responsive to their citizens (Beblawi and Luciani 1987). Fearon and Laitin (2003) argued that weaker state apparatuses caused by the dependence on oil revenues provide more opportunities for rebel mobilization. That is, although the rentier state effect theory argues that oil revenues are likely to increase political stability by dampening social pressures, the weak state effect theory argues that oil revenues are likely to decrease political stability because oil revenues allow political leaders to rely less on state apparatuses and, thus, weaken the apparatuses.

These theories have not clearly and consistently suggested the effect of oil on political stability. I argue that the ambiguous theories have been generated because prior studies have insufficiently specified the effect of oil on political stability. For example, because prior studies on democratization have focused primarily on oil as financial sources of oil-funded states' governments and on how the use of oil revenues affect political stability. However, because prior studies on civil war onset have focused more on the effect of oil extraction processes or potential oil revenues, which both the government and rebels can access, on political stability, they have argued that oil is likely to reduce political stability. In addition, resource revenues are generally generated by international or transnational trade (de Soysa 2002; Gleditsch 2002a, 2007). This implies that political instability problems in an oil-exporting state can affect its oil trade partners, and, thus, oil trade ties can affect its political stability by encouraging its oil trade partners to intervene in domestic politics of the exporter. Therefore, in order to more accurately analyze the relationship between oil and political stability, the effect of oil should be more thoroughly specified. I classify the effect of oil on political stability into three components: the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. In the next part, I review two conditions of coup risk.

4.3 Determinants of coup risk

The literature on the decision to attempt a coup has generally been thought of in terms a rationalist framework. Coups are costly because the consequences of a failed coup generally include prison, exile, and death (Svolik 2009). Thus, if coup plotters are satisfied status quo or they do not believe that the anticipated benefits from staging a successful coup are high and they have a high likelihood of success, coups are unlikely. This implies that the decision to stage a coup depends on two conditions: the anticipated payoff from an attempted coup (disposition to intervene) and the perceived probability of a

coup's success (ability to intervene) (Thyne 2010; Powell 2012).¹⁸

4.3.1 Disposition to Intervene

Factors of the expected payoffs from staging a successful coup can be classified into two kinds of factors: actor-oriented factors, which motivate officers within the state apparatus to stage a coup attempt, and structural factors, which make a regime more vulnerable to a coup attempt.¹⁹ First, if officers disfavor a current regime (Decalo 1990) or their organization interests, especially militaries' interests, are at stake (Thompson 1973; Svolik 2009), they are likely to decide to stage a coup attempt. For example, prior studies have argued that militaries, who are not satisfied with their organizational resources, are more likely to stage a coup attempt while higher levels of military spending allow the polity to buy off military opportunists and reduce coup risk (e.g., Huntington 1991; Collier and Hoeffler 2007; Besley and Robinson 2010; Leon 2011; Powell 2012).

Second, coup plotters can decide to stage a coup attempt, when they can justify their action (Wiking 1983). The justification generally depends on the level of a regime's legitimacy. When the level of a regime's legitimacy is low, coup plotters can obtain better and more stable results from a coup's success and can remove the possibility that civil society or other coup plotters try to oust the new leader (Wiking 1983). Legitimacy is generally affected by discontent with the regime, economic performance, and international pressures. If governments fail to deliver on the expectations of their citizens due to insufficient political institutions, overt grievances of the public from the failure can be revealed by popular protests or revolution and the protests or revolution can be a signal to coup plotters that the public will be less likely to resist (or may even support) their coup attempt (Belkin and Schofer 2003; Acemoglu

¹⁸ Svolik (2009) also indirectly used the rationalist framework to analyze coup risk in authoritarian regimes with two concepts: the *ex ante* credibility of the coup threat and the *ex post* credibility of the coup threat.

¹⁹ This classification is similar with Belkin and Schofer's (2003) classification of coup causes. However, because they did not use the rationalist framework toward coup risk and did not classify determinants of a coup attempt into disposition to intervene and ability to intervene, I use new terms to more clearly classify factors of disposition to intervene.

and Robinson 2006; Wig and Rød 2012). In addition, because poverty and economic decline can generate social grievances that destabilize the society, they encourage coup plotters to predict large improvement in the future and stage a coup attempt (Londregan and Poole 1990; Belkin and Schofer 2003). However, higher income or economic growth generally satisfy the public and solidify a government's legitimacy that can inhibit coups. Finally, legitimacy might be reduced by hostile signals from international actors, such as mobilizing troops or imposing sanctions, but might be improved by supportive signals from them, such as alliance and trade ties or foreign aid (Thyne 2010).

4.3.2 Ability to Intervene

Political leaders, who lack necessary resources to placate potential coup plotters, often try to create structural obstacles to increase coordination costs to the coup plotters, called "coup-proofing" and reduce the likelihood of a coup's success (Pilster and Böhmelt 2011). Generally, coup proof strategies include increasing the size of the military (Powell 2012), building up counter-forces that check and balance each other (Belkin and Schofer 2003), rotation of military officers (Pollack 2002), military specialization (Quinlivan 1999), and membership in a unifying institution (Weeks 2008; Frantz and Ezrow 2011). Prior studies have revealed that these coup proof strategies are likely to deter a coup attempt (Powell 2012).

In short, coup plotters stage a coup when they have enough evidence that the anticipated benefits of an attempted coup and the likelihood of success are high. Thus, if a factor can affect the anticipated benefits of an attempted coup and/or the likelihood of success, the factor would ultimately affect coup risk. Prior studies have focused on the effects of oil on political instability, including regime type and civil war onset. Because their theories have explained how oil affects public support and military abilities, oil may affect both the anticipated benefits of an attempted coup and the likelihood of success and may ultimately explain coup risk. The following sections specify how oil affects political instability, and provide the theoretical framework to study the relationship between oil and coup risk.

4.4 Oil and coup risk

In order to analyze the relationship between oil and coup risk, I decompose oil into three aspects: oil revenues, oil reserves, and oil trade ties. Oil revenues are the realized fiscal ability of the government generated from oil. The level of oil revenues reflects the ability of government to invest money to repress and/or appease opposite groups. However, oil reserves are potential profits that will be realized when the oil reserves are extracted and exported. This implies that if an actor, such as a coup plotter or a rebel leader, has an ability to succeed in a coup attempt or win a victory in a civil war, the actor as the new government can realize profits from oil reserves of the actor's state. That is, it would not be certain about the owner of oil reserves, if a state has severe political instability problems. Finally, most oil-producing states obtain oil revenues by exporting oil to other states. However, because oil is a primary energy sources in most states but a limited number of states can produce and export it, the break of oil trade ties generally more damage oil-importing states' economies than oil-exporting states' ones. Thus, oil-importing states are willing to avoid the break of their oil trade ties, and are sensitive to their oil trade partner' political instability problems that can break the importers' oil trade ties. This implies that an oil-producing state's oil trade ties reflect the effect of oil on external actors' decisions related with the oil producer's domestic politics. I specify how three aspects of oil affect expected payoffs from an attempted coup and perceived probability of a coup's success.

4.4.1 Oil Revenues and Coups

The literature on democratization has generally suggested two causal explanations: the rentier state effect and the repression effect (e.g., Ross 2001; Smith 2004).²⁰ The rentier state effect suggests that political leaders in an oil-funded regime more freely decide to spend money because they manage the exceptional

²⁰ Recent studies have revealed that the repression effect theory does not explain the relationship between oil revenues and democratization. However, because the repression effect provide one possible way to explain how oil revenues affect potential coup plotters, including militaries, I apply the repression effect theory to the relationship between oil revenues and coup risk.

fiscal size, but their decisions rarely suffer from social checks. Thus, oil revenues allow political leaders to more easily show good economic performances with low tax rates and high social spending to the public and, thus, help them to maintain the higher level of legitimacy that decrease expected payoffs from an attempted coup. For example, in the 1970s, Venezuela enjoyed economic prosperity, including the high level of social welfare programs and subsidies for commodities and public services, based on large oil revenues (AP 1992). However, in the 1980s, after other oil-producing states, including Saudi Arabia, raised their oil production (U.S. Energy Information Administration 2015b), world oil prices dropped. Although the low oil prices substantially reduced Venezuela's oil revenues (Haber and Menaldo 2011) and per capital income (Gleditsch 2002b), the government of Venezuela had continued its spending on social welfare programs and subsidies for commodities and public services at the same levels. This caused large government deficit and widespread corruption. In order to reduce the deficit, in 1989, the International Monetary Fund offered assistance and required fiscal reforms, and President Carlos Andrés Pérez adopted neoliberal and austerity policies. These policies caused the high level of public discontent, and in 1992, lieutenant colonel Hugo Chávez Frías staged a coup.

The repression effect theory argues that oil revenues allow an oil-funded regime to invest in repressive apparatuses that can keep political leaders in power despite social opposition, including strengthening military capabilities and increasing military size (Ross 2001; Bellin 2004). As stated above, because political leaders more freely decide to spend oil revenues, they easily provide better pay or resources for militaries that reduce militaries' disposition to intervene. In addition, oil revenues help political leaders coup-proof, including making larger militaries, building up counter-forces that check and balance each other, and military specialization, which can reduce militaries' ability to intervene by causing collective action problems that potential coup plotters may face when confronting a government with a coup.

In sum, oil revenues are likely to decrease coup plotters' disposition to intervene and the

perceived probability of a coup's success in three ways: oil revenues are likely to increase the legitimacy of a current government because oil revenues allow political leaders to maintain low tax rates and spend more money to lower social grievances; oil revenues allow political leaders to invest more money in repression apparatuses to dampen their disposition to stage a coup with better pay or resources; oil revenues allow political leaders to cause collective action problems that reduce the perceived probability of a coup's success. This expectation yields the first hypothesis:

H1: As a state's oil revenues increase, the likelihood of coup in the state should decrease.

4.4.2 Oil Reserves and Coups

Although oil revenues are realized wealth, oil reserves are potential wealth that a current government has the priority over but its owner is not yet determined. This implies that potential coup plotters can access to the potential oil wealth if they succeed in overthrowing a current government. Thus, I argue that the effect of oil reserves is opposite to the effect of oil revenues. There are three causal explanations about how oil reserves affect coup risk.

First, oil reserves are likely to increase the value of capturing the state (Fearon and Laitin 2003), and, thus, encourage domestic groups to try to benefit from oil (Collier and Hoeffler 2004). Generally, the discovery and production of oil can radically increase government finances. For example, after Nigeria became a major oil producer in the late 1960s, the Nigerian government's total revenues increased by about 440 percent from 1969 to 1977 (Bevan, Collier, and Gunning 1999). Thus, a state's oil reserves as potential fiscal sources can promise coup plotters large economic benefits from a coup success, and can allow the plotters to promise that they will distribute more wealth from oil reserves to the public and to dampen the possibility that civil society or other coup plotters try to oust the new leader. This implies that oil revenues increase the anticipated benefits from a coup's success.

Second, oil reserves in a state may be an incentive for external actors, who seek a new or better

opportunity to obtain benefits from the oil reserves, to engage in the state's domestic politics in an attempt to spur coups. For example, after Hugo Chavez won the presidential election in 1998, crude oil and petroleum products exported to the United States (US) from Venezuela decreased although Venezuela as the state that had the fifth largest oil reserves (about 77.69 billion barrels) could export more oil to the US.²¹ In 2002, members of military and pro-business elites represented by Venezuelan Federation of Chambers of Commerce (Fedecámaras) president Pedro Carmona staged a coup to oust President Hugo Chavez. After Chavez was restored by a combination of military loyalties and public support for his government, he asserted that the coup attempt was orchestrated by the United States (US) government and the release of newly declassified intelligence documents showed that the CIA and the US government officials had advanced knowledge of an imminent plot to oust President Chavez (Forero 2004). This case reveals that oil reserves in a state are likely to provide an incentive for third parties who do not have an oil trade tie with the state or want to import more oil from the state to disrupt the state's domestic politics. This implies that oil reserves increase the perceived probability of a coup's success by increasing the likelihood of hostile signals or hostile intervention to governments from external actors.

Third, in contested autocratic regimes, which have a power struggle between a dictator and a ruling coalition, oil reserves are likely to increase coup risk. A dictator in a contested autocratic regime tries to acquire more power to reduce the relative power of ruling coalition and, ultimately, the threat of a coup d'état that ruling coalition uses to deter the dictators' opportunism and improve their survivability (Svolik 2009). Oil reserves in a contested autocratic regime, as state-owned assets that can radically increase government finances and as sources of government finances that a state more easily conceals relevant information from the public and ruling coalition (Ross 2013), help a dictator to secretly acquire

²¹ In 1998, the US imported 627,416 thousand barrels crude oil and petroleum products from Venezuela (U.S. Energy Information Administration 2015c). However, the average amount of the US imports from Venezuela of crude oil and petroleum products from 1999 to 2002 is 547,005 thousand barrels (U.S. Energy Information Administration 2015a).

more power and to stabilize his or her political status. Particularly, although state actors except political leaders are likely to know significant increases in oil reserves, they rarely know small changes in reserves (Bell and Wolford 2014). This implies that oil reserves can alter the dictator's and the ruling coalition's expectations about the *future* distribution of power, and the ruling coalition's expectations are based on imperfect information about oil reserves. These characteristics of oil reserves in a contested autocratic regime increase the likelihood of a coup attempt in two ways. First, oil reserves may make the dictator less able to credibly promise to uphold prior agreements between the dictator and the ruling coalition, because the reserves may create for the ruling coalition a fear that tomorrow's deal may be substantially worse regardless of today's deal. This situation may create commitment problems in contested autocratic regimes that encourage the ruling coalition to stage a coup despite high costs of a coup attempt, like commitment problems in the civil war bargaining generated by oil discoveries (Bell and Wolford 2014). Second, because the ruling coalition is less likely to know small changes in oil reserves than the dictator, the ruling coalition's expectation about the future distribution of power might be not same as the dictator's expectation. This imperfect information of ruling coalition might frustrate the bargaining over the power distribution between the dictator and the ruling coalition and encourage the ruling coalition to stage a coup (Svolik 2009). In sum, these three effects of oil reserves lead to the second hypothesis:

H2: As a state's oil reserves increases, the likelihood of coup in the state should increase.

4.4.3 Oil Trade Ties and Coups

States are concerned about the stability of their oil trade ties. This is because although a limited number of states can produce and export it, most states use oil as a primary energy source or a raw material for making industrial products. This exporter-favored international oil trade market structure makes oil-importing states sensitive to political instability in oil-exporting states. For example, in 1979, the Iranian Revolution hindered oil production and exports to other states, and drove up crude oil prices in the international oil market. This significantly damaged the economies of numerous oil-importing states. This

implies that the break of oil trade ties caused by political instability in an oil-exporting state may generate high costs to oil-importing states. Thus, oil-importing states are likely to prefer stable oil trade ties with an oil-exporting state's current government to new oil trade ties with the new government established by a coup's success, and are more likely to support the current government to avoid the break of their oil trade ties.

The effect of oil trade ties on coup risk is derived from three factors of a state's oil trade ties: depth, breadth, and closeness. First, the depth of a state's oil trade ties is the total oil amount of an oil-exporting state's oil trade ties that captures costs of breaking the oil trade ties that oil-importing states would bear. Thus, higher levels of the depth of an oil-exporting state's oil trade ties make oil-importing states more concerned about and more likely to intervene in a political instability problem in the oil exporter. Second, the breadth of an oil-exporting state's oil trade ties is the number of the oil exporter's oil trade partners that captures the number of states that would bear costs from breaking an oil-exporting state's oil trade ties. That is, the higher level of the breadth of a state's oil trade ties makes more states likely to intervene in a political instability problem in the oil exporter. Third, the closeness of an oil-exporting state's oil trade ties captures the level of state's oil trade proximity to all other states. Because there are a few oil-exporting states but many oil-importing states in the international oil trade market, oil trade ties of an oil-exporting state can affect crude oil prices (the balance between the demand and the supply for oil) and, thus, can affect most oil-importing states. Thus, even if some oil-importing states do not have a direct oil trade tie with an oil-exporting state, the break of an oil-exporting state's oil trade ties may damage the oil-importing states. The closeness of a state's oil trade ties emphasizes the indirect role of the state's oil trade ties. These three factors capture the effect of an oil-exporting state's oil trade ties on the international oil market and the ability of its government to attract external support. The higher level of the combination of these three factors of a state's oil trade ties, the more likely they are to encourage oil-importing states to support its government to avoid the break of its oil trade ties.

This implies that oil trade ties as signals from external actors can affect the perceived probabilities of a coup's success. Signals are defined as "actions or statements that potentially allow an actor to infer something about unobservable, but salient, properties of another actor" (Gartzke 2003, 1). Generally, signals from external actors, which indicate the continuation of the government, or supportive signals, are likely to decrease coup plotters' perceived probabilities of a coup's success and, thus, coup risk, because their coup attempt is more likely to face external resistance (Thyne 2010). This implies that because oil trade ties encourage external support an oil-importing state's government, oil trade ties as supportive signals can decrease the perceived probability of staging successful coups and coup risk. This expectation yields the third hypothesis:

H3: As the effect of a state's oil trade ties on the international oil trade market increase, the likelihood of coup in the state should decrease.

Furthermore, I also argue that the effect of oil reserves on coup risk interacts with the effect of oil trade ties. As stated above, oil reserves as potential revenue sources encourage greedy third parties, who desire to obtain benefits from the oil reserves, to send hostile signals, or support for political change, that facilitate coup plotters' coup attempt. However, oil reserves in an oil-exporting state with the greater effect of oil trade ties in the international oil market are potential benefit of the exporter's oil trade partners. This implies that an oil-exporting state's higher level of oil reserves can increase the likelihood of supportive signals from its oil trade partners to protect their potential benefits from the oil reserves and decrease the likelihood of a coup attempt. However, if an oil-exporting state exports the lower amount of oil to fewer states, there would likely face more greedy third parties, who try to support its political change to obtain new benefits from its oil reserves. This implies that oil reserves in an oil-exporting state with the lower effect of oil trade ties on the international oil market are likely to increase coup risk by decreasing coup plotter's perceived probability of a coup's success. For example, the democratically elected Prime Minister of Iran Mohammad Mosaddegh was overthrown by the 1953 Iranian coup d'état

orchestrated by the United Kingdom (the UK) and the United States. Before the Iranian coup, the Mossadegh government tried to nationalize the assets of the Anglo-Iranian Oil Company (AIOC) and the British Corporation (now British Petroleum) and expel their representatives from Iran. Because Iran had large oil reserves but tried to reduce the power of the US and the UK over them, these two states feared that they could lose their oil trade ties and, thus, intervened in the domestic politics of Iran. In sum, oil reserves in an oil-exporting state with the lower effect of its oil trade ties on the international oil market are more likely to attract hostile signals from greedy third parties and have higher coup risk, while oil reserves in an oil-exporting state with the higher effect of its oil trade ties on the international oil market are more likely to encourage supportive signals from oil-importing states and reduce coup risk. This expectation yields the fourth hypothesis:

H4: As the effect of a state's oil trade ties on the international oil trade market increase, the effect of oil reserves in the state on coup risk should decrease.

4.5 Research Design

The theory provides several testable hypotheses. I predict that a coup is less likely to occur if a regime has a high level of oil revenues (H1) or a high level of trade ties (H3). In contrast, coups should be less likely as oil reserves increase (H2). One conditional relationship was also discussed. I expect to see that the influence of oil reserves on coups decrease as oil trade ties increase (H4).

The unit of analysis to test of this study is country-year for all states from 1986 to 2010. This study examines coup attempt using the coup dataset developed by Powell and Thyne (2011). They define coups as “attempts by the military or other elites within the state apparatus to unseat the sitting head of government using unconstitutional means” (Powell and Thyne 2011, 249-259). This measure takes the value one in the year that a state experiences at least one coup attempt, and zero otherwise. I refer to this

measure as *Coup Attempt*. This dataset accounts for 110 coup attempts from 1986 to 2010 (2.71% of all country-years).

In order to examine the impact of oil on coup risk, I employ the logistic regression. Standard errors are clustered by states to account for potential unobserved state-level heterogeneity. To control for temporal dependence, I include a variable counting the number of years without a coup with the cubic polynomial approximation (Carter and Signorino 2010). All independent variables are lagged one year to avoid endogeneity problems.

4.5.1 Oil Revenues, Oil Reserves, and Oil Trade Ties

In this study, I hypothesize that three aspects oil affect coup risk in different ways. In order to test the expectations, I employ three measures to capture each aspect of oil. First, in order to measure the effect of oil revenues on coup risk, I use *Oil Income per capita*. The most accurate measurement of oil revenues' effect on coup risk is fiscal reliance on oil income, which is the percentage of government revenues from oil rents that finance a regime without taxing citizens (Haber and Menaldo 2011). However, because autocratic oil-exporting states are likely to conceal their fiscal information, it is difficult to measure fiscal reliance on oil income.²² Thus, I use *Oil Income/capita* as an alternative measure. This variable is estimated as the total value of crude oil production (metric tons), divided by population, multiplied by the real world price, and expressed in 2013 dollars using the EIA international oil production data (U.S. Energy Information Administration 2015b) and the British Petroleum (BP) world oil prices data (British Petroleum 2014). This variable is logged and lagged one year.

Second, I measure the effect of oil reserves on coup risk as proved oil reserves of crude oil (billion barrels) using the EIA international oil reserves data (U.S. Energy Information Administration

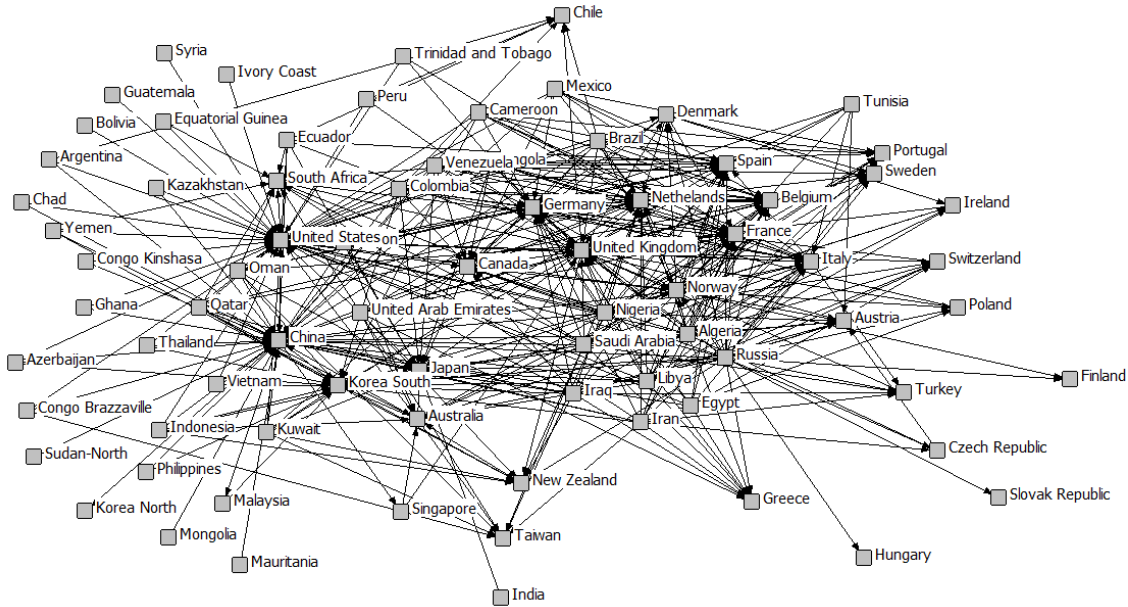
²² Although Haber and Menaldo (2011) estimated fiscal reliance on oil rents, their dataset covers eighteen major oil exporters and has the retrieval and standardization problem.

2015a). Although Bell and Wolford (2014) argued that the discovery of oil rather than oil reserves causes political instability and civil war onset because of commitment problems, the discovery of oil may capture the influence of internal dynamics between political leaders and ruling coalition on coup risk but may not capture influences of third parties (or hostile signals from third parties to a government with oil reserves) on coup risk. Thus, I use proved oil reserves of crude oil to capture both internal and external effects of oil reserves on coup risk. I refer to this measure as *Oil Reserves*. This variable is logged and lagged one year.

Third, in order to measure the effect of a state's oil trade ties on coup risk, I employ network analysis, specifically closeness centrality in weighted networks. In network analysis, a network consists of a set of nodes (e.g., people, institutions, states) connected by a set of edges (e.g., friendship, alliance, trade) (Maoz 2009). Because a state's oil trade ties in the international oil market are affected by oil trade ties of other states, oil trade ties are one kind of interaction among states. Thus, the international oil market is a network comprised of states (nodes) and their oil trade relations (edges). The network is formally represented as an $n \times n$ adjacency matrix where matrix entries x_{ij} indicate a tie between node i and node j . Because oil export is more influential in the international oil market than oil import, oil trade ties are *directed*, or $x_{ij} \neq x_{ji}$. In order to combine three factors of oil trade ties (depth, breadth, and closeness), I weight oil trade ties such that x_{ij} is a weighted oil trade tie from i to j as metric tons of oil that state i exports to state j . The oil trade ties are estimated by numerous oil trade datasets (see Online Appendix A). For a given year, the oil trade network is represented as adjacency matrix \mathbf{X} , which captures the totality of the trade network and indicates who trades oil with whom and at what levels. Based on these data, the oil trade network consists of 167 independent states and their oil trade ties with other states. Figure 4-1 is a sociogram of the oil trade network in 2011 that reveals the structure and flows of oil trade ties. In Figure 4-1, a node is a state, and an arrow is an oil trade tie indicating the direction of oil trade from an exporter to an importer. If a node has many arrows, the node would be considered a major oil-importing or -

exporting state.

Figure 4-1. The Structure of the Oil Trade Network in 2011.



Note: This figure describes the structure of the oil network. Each square indicates each state in the oil network, and each arrow is each oil trade relation between two countries. The direction of each arrow indicates the flow of each oil trade relation from an exporter to an importer. However, squares and arrows do not indicate geographical characteristics.

This study focuses on actor centrality, a network property associated with power and prestige of each node in a network (Borgatti 2005). The arguments of the previous sections suggest that a state's oil trade ties may be the source of supportive signals from external actors to the government, and, ultimately, may reduce coup risk. In order to measure the effect of a state's oil trade ties on coup risk, I employ closeness centrality in a weighted network (Opsahl, Agnessens, and Skvoretz 2010), a combination of all three components of a state's oil trade ties. In order to measure each state's weighted closeness centrality, I calculate the sum of geodesic distances from a node to all others, defined as number of links in the shortest path between two nodes (Borgatti 2005). For example, if we assume that all oil trade ties mean one metric ton of oil and two states are immediately connected with each other, their geodesic distance is one. If the geodesic distance between state *a* and another state *b* is two, state *a* exports (or imports) oil to

(or from) state c , and the state c exports (or imports) oil to (or from) state b . The geodesic distance between i and j to calculate each state's closeness centrality in a weighted network is calculated by the following formula (Opsahl, Agneessens, and Skvoretz 2010):

$$d^w(i, j) = \min \left(\frac{1}{x_{ih}^\alpha} + \dots + \frac{1}{x_{hj}^\alpha} \right) \quad (1)$$

where, as before, h represents intermediate nodes. In equation (1), the value of α must be determined by theory (Kinne 2012). If $\alpha = 0$, $d^w(i, j)$ is equal to the geodesic distance between i and j without weights. That is, the geodesic distance is calculated by the presence or absence of an oil trade tie between two states, and would miss the effect of the depth of a state's oil trade ties. However, as the value of α increases, stronger ties are more weighted, such that stronger ties are assumed to constitute shorter paths (Kinne 2012). Based on equation (1), Opsahl, Agneessens, and Skvoretz (2010) define closeness centrality in weighted networks as

$$C_c^w(i) = \left[\sum_{j=1}^n d^w(i, j) \right]^{-1} \quad (i \neq j). \quad (6)$$

Because oil trade ties in the oil trade network are directed, I use only out-closeness centrality in weighted networks (the effect of a state's oil export ties) to estimate an oil-exporting state's ability to attract supportive signals from oil-importing states to its government. To balance breadth and depth, I set α at 0.5.²³ I refer to this measure as *Weighted Closeness*.²⁴

²³ When $\alpha > 1$, the impact of additional intermediary nodes is relatively unimportant compared to the depth of ties and paths with more intermediaries, which is inconsistent with the logic of oil trade relationships. Also, while the depth of ties is ignored ($C_c^w(i) = C_c(i)$) when $\alpha = 0$, the breadth of ties is ignored $\alpha = 1$. Because of these characteristics of α , Kinne (2012) also set $\alpha = 0.5$ to capture the degree of trade integration.

²⁴ *Weighted Closeness* is calculated by "tnet" package (Opsahl 2009) in R 3.1 (R Development Core Team 2014).

4.5.2 Control Variables

Numerous control variables are included to assure that the factors identified in Table 4-1 are isolated from other measures that might influence coups. I begin with coup-proofing strategies. I might expect that people in democracies are likely to address grievances through institutions or elections than extra-constitutional measures while people in established autocracies are less likely to use extra-constitutional measures because a dictator may effectively eliminate potential coup plotters (Svolik 2009). This implies that consolidated democracy and established autocracy should dampen coup risk. These expectations are tested with a variable for the level of democracy, using the Polity IV data set (Marshall and Jagger 2008). I use the Polity 2 score from the Polity IV data set, and refer to it as *Polity*. Because of the expectations for the inverse U-shaped effect of the democracy level on coup risk, I use both *Polity* and *squared Polity*. Next, *Expenditures/Soldier* measures the natural log of military expenditures per soldier, using the Correlates of War capability (CINC) components data (Singer, Bremer, and Stuckey 1972). Because states with the higher level of military expenditures per soldier are likely to have soldiers with more training, better equipment, and better financial incentives to maintain the status quo, the higher level of military expenditures per soldier is likely to lower the expected utility of a coup and, thus, coup risk (Powell 2012). *Military Personnel* measures the size of a military, the natural log of the number of soldiers in a military, using the CINC data (Singer, Bremer, and Stuckey 1972). The bigger size of military may create structural obstacles that create coordination challenges for militaries, and, thus, is likely to lower coup risk. *Military Regime* is a dummy variable coded 1 for military or combined military-civilian regimes, and 0 for civilian regimes (Geddes, Wright and Frantz 2014). Prior studies have revealed that military regimes are vulnerable to coups because they lack the legitimacy and popular support and they may be internally weak compared to other regime types (e.g., Geddes 1999; Belkin and Schofer 2003; Thyne 2010).

The second set of control variables captures the expected benefits of staging a coup. Prior studies have found that bad economic performances increase coup risk (Londregan and Poole 1990).

Thus, I include *GDP/capita*, which measures the natural log of GDP per capita based on the dataset from Gleditsch (2002b), and *Economic Growth* (lagged), which the percentage change in GDP per capita from year to year. The third set of control variables is meant to isolate coups from other forms of anti-regime activity. *Instability* is the sum of annual magnitude scores of civil violence, civil warfare, ethnic violence, and ethnic war in the Major Episodes of Political Violence dataset (Marshall 1999). Finally, I include *Post-Cold War*, a dummy variable that takes the value “1” if a year is in the period from 1991 and the value “0” otherwise, because the international structure might affect external actors’ decisions to send supportive or hostile signals to a state.

4.6 Results

I begin by examining the influence of oil revenues, oil reserves, and oil trade ties on coup risk in Table 4-1, including the baseline logit model of coup risk to test H1-H3 (Model 1), the logit model of coup risk to test H4 (Model 2), and two rare-events logit models to check robustness (Models 3-4).²⁵ All models can be interpreted similarly with positive coefficients indicating that a coup attempt becomes more likely as the independent variable increases. The first model tests effects of three independent variables on coup risk. The positive and statistically significant coefficient of *Oil Reserves* ($p < .005$) and the negative and the statistically significant coefficient of *Weighted Closeness* ($p < .005$) in Model 1 provide initial support for the general expectations for the effect of oil on coup risk. That is, the higher level of oil reserves in an oil-exporting state increases coup risk by encouraging greedy potential coup plotters to stage a coup attempt or by attracting hostile signals from greedy third parties to its government. However, the increase in *Weighted Closeness* reduces coup risk by increasing the likelihood of supportive signals from external

²⁵ When I deal with very rare events, such as conflicts or coups, logit models are likely to underestimate the likelihood of the rare events and over-represent the rare events in the dataset (King and Zeng 2001a). These two problems can cause biases of estimators. Thus, two rare-events logit models, Models 3-4 in Table 1 can check the robustness of results in Models 1-2 in Table 1.

actors. Empirical results in Model 3 in Table 4-1 support the robustness of these effects on coup risk.

However, the effect of oil revenues on coup risk is not statistically significant.

Table 4-1. The Oil Trade Network Centrality and Coup Risk, 1986-2012.

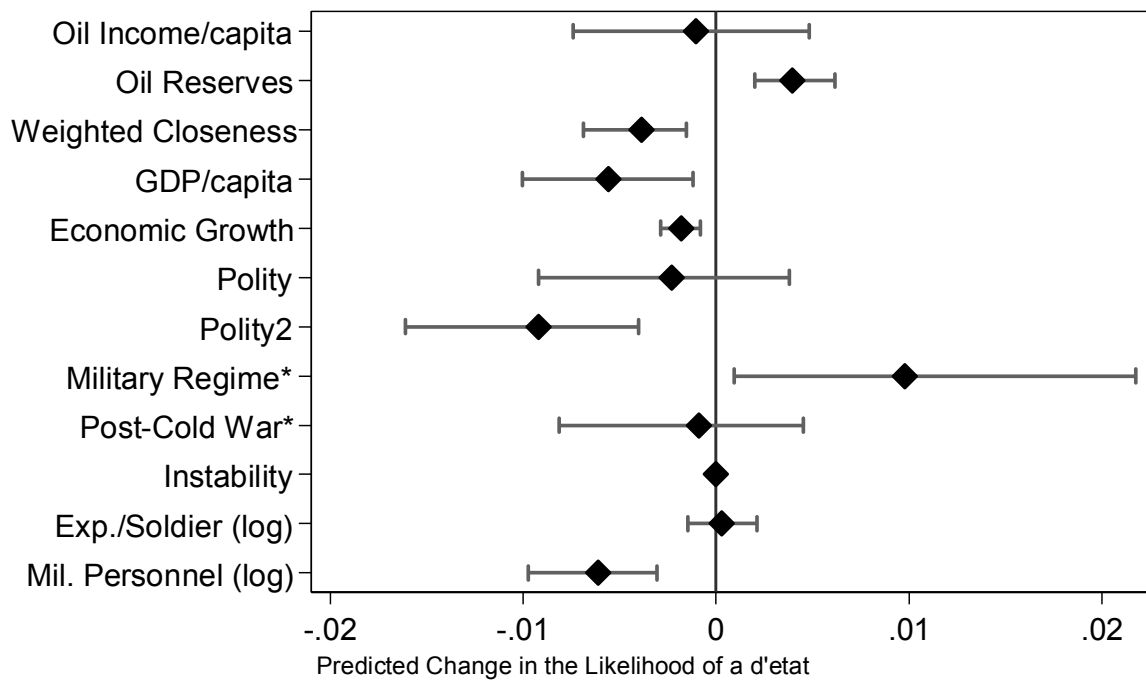
	Model 1 (Base Model)	Model 2 (H4)	Model 3 (Rare-events logit)	Model 4 (Rare-events logit)
<i>Oil Income per capita</i> (log)	-0.023 (0.081)	-0.042 (0.080)	-0.020 (0.081)	-0.032 (0.079)
<i>Oil Reserves</i> (log)	0.641*** (0.227)	0.690*** (0.228)	0.636*** (0.226)	0.662*** (0.227)
<i>Weighted Closeness</i>	-0.084*** (0.030)	-0.052 (0.056)	-0.080*** (0.030)	-0.057 (0.056)
<i>Oil Reserves</i> (log) × <i>Weighted Closeness</i>		-0.010 (0.016)		-0.006 (0.016)
<i>Polity</i>	-0.015 (0.027)	-0.015 (0.027)	-0.015 (0.026)	-0.015 (0.026)
<i>Polity</i> ²	-0.015*** (0.005)	-0.016*** (0.005)	-0.015*** (0.005)	-0.015*** (0.005)
<i>Exp./Soldier</i> (log)	0.014 (0.057)	0.013 (0.057)	0.003 (0.056)	0.002 (0.057)
<i>Mil. Personnel</i> (log)	-0.276*** (0.086)	-0.283*** (0.086)	-0.273*** (0.085)	-0.278*** (0.086)
<i>Military Regime</i>	0.660* (0.342)	0.650* (0.346)	0.658* (0.340)	0.644* (0.343)
<i>GDP/capita</i> (log)	-0.256** (0.130)	-0.249* (0.131)	-0.244* (0.130)	-0.236* (0.130)
<i>Economic Growth</i>	-2.611*** (0.779)	-2.605*** (0.785)	-2.552*** (0.775)	-2.538*** (0.780)
<i>Instability</i>	0.131** (0.062)	0.128** (0.064)	0.132** (0.062)	0.131** (0.064)
<i>Post-Cold War</i>	-0.033 (0.348)	-0.037 (0.347)	-0.028 (0.346)	-0.030 (0.345)
<i>Constant</i>	1.034 (1.090)	1.022 (1.088)	1.020 (1.084)	0.987 (1.082)
<i>N</i>	2,828	2,828	2,828	2,828
Wald chi2	132.6***	134.4***		
<i>N</i> _{States}	151	151	151	151
Hosmer-Lemeshow chi2	7.56	10.64		
ROC	0.828	0.829		

*p<.10, **p<.05, ***p<.01 (two-tailed).

^a Cell entries report coefficients and cluster-corrected standard errors (in parentheses) from logistic regressions. Years since coup not shown.

Beyond statistical significance, I gauge the impact of the independent variables by calculating each variable's marginal effect on the dependent variable, using the *Clarify* program (King, Tomz, and Wittenberg 2000; Tomz, Wittenberg, and King 2003). The results for these calculations are graphically presented in Figure 4-2. Figure 4-2 displays how we should expect the likelihood of a coup attempt to vary when each independent and control variable is allowed to vary from its 25th to 75th percentile for continuous variables and from 0 to 1 for dichotomous variable while holding all other variables constant (means and modes).

Figure 4-2. The Effect of Weighted Closeness on Probability of Prewar Intervention, 1986-2010: Substantive Effects.

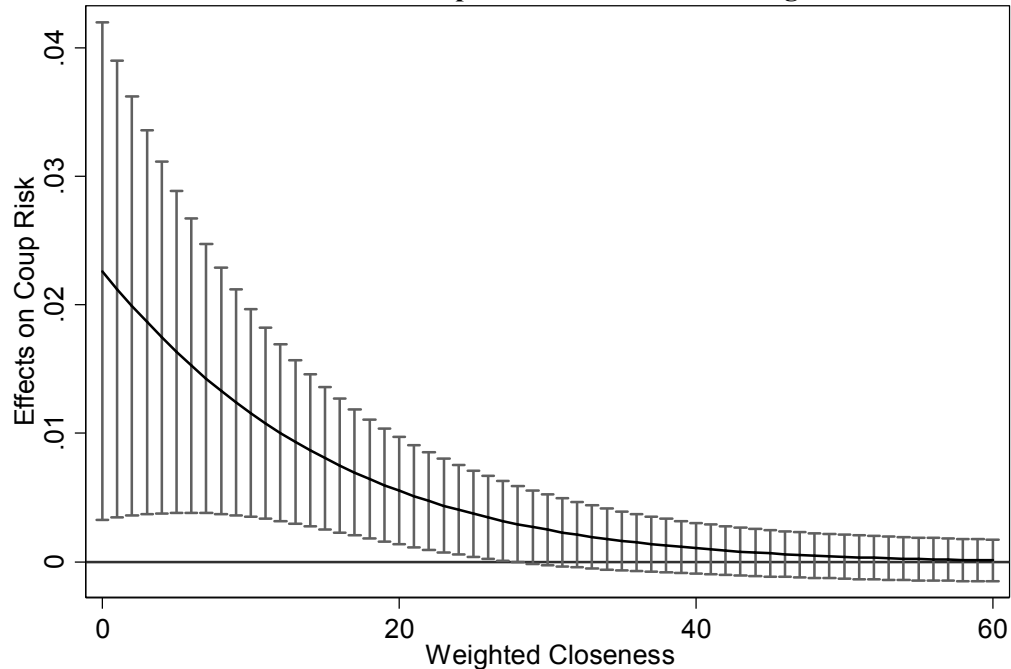


Note: Values reveal first difference (FD) estimations (◆) with 90% confidence intervals (|-|). Estimations come from Table 4-1, Model 1.

We first see that oil reserves and *Weighted Closeness* provide substantial leverage in our ability to predict the likelihood of a coup attempt. A move from the 25th to 75th percentile (0-.41, ln values) in oil reserves increases the likelihood of a coup attempt by around 59.2% (.0067-.0106). Also, a move from

the 25th to 75th percentile (0-3.38) in *Weighted Closeness* decreases the likelihood of a coup attempt by around 27.9% (.0138-.0100). These results provide strong support for H2 and H3.

Figure 4-3. The Effect of Oil Reserves on Coup Risk conditioned on Weighted Closeness.



Regarding the control variables, we see results that are generally consistent with previous studies. An anocracy is more likely to experience a coup attempt than stable autocracies or consolidated democracies. If a state's polity score is 9, such as Jamaica, the state is around 57.5% (.0160-.0068) less likely to experience a coup attempt than a state, whose polity score is 5, such as Ecuador. A military regime is around 97.4% more likely to experience a coup attempt than a non-military regime. Also, states are around 44.5% (.0138-.0076) less likely to experience a coup attempt as the military size varies its 25th to 75th percentile (1.95-4.63, ln values). These results concur with previous work on the relationship between coup-proofing strategies and coup risk. In addition, two variables capturing economic performances, *GDP/capita* and *Economic Growth*, significantly affect coup risk. A move from the 25th to 75th percentile (7.49-9.47, ln values) in *GDP/capita* reduces coup risk by around 41.9% (.0133-.0077),

and a move from the 25th to 75th percentile (-.02-.06) in *Economic Growth* reduces coup risk by around 16.3% (.0110-.0092).

In Table 4-1, Models 2 tests conditional hypotheses (*H4*). Brambor, Clark, and Golder (2006) explain that interactive terms are the best way to test conditional hypotheses where the effect of one variable depends on the value of other variables. However, because the coefficients on the interactive terms provide restricted information, I analyze the interactive terms by plotting the marginal effect of oil reserves versus the conditional variable, *Weighted Closeness*, while holding control variables constant at their means/modes. I present the primary finding for the conditional hypothesis (*H4*) in Figure 4-3.

The fourth hypothesis predicts that the increase in *Weighted Closeness* is likely to reduce the effect of oil reserves on coup risk. This expectation is examined in Model 2 in Table 4-1. As shown in Figure 4-3, the effect of oil reserves on coup risk becomes increasingly smaller as *Weighted Closeness* moves from its minimum to maximum values. However, this effect is only significant once the lower confidence interval is above the horizontal zero line. Thus, we can conclude that the effect of *Weighted Closeness* reduces the effect of oil reserves on coup risk only when *Weighted Closeness* of a state is lower than around 26. Because the majority of oil-exporting states (around 50%) fall within the area of significance, the empirical result supports the fourth hypothesis for the half of oil-exporting states.

Finally, I run tests for model fit. In addition to the common Wald's chi-squared statistics, which are significant at $<.001$ for all models, I include Hosmer and Lemeshow (2000) and Receiver Operating Characteristic (ROC) curve analyses (King and Zeng 2001b). Hosmer and Lemeshow test divides subjects into deciles based on predicted probabilities and then compute a chi-squared test between observed and predicted values of coup risk between each group with the null hypothesis that groups are similar. In Table 4-1, all models' chi-squared values of Hosmer and Lemeshow test are insignificant, indicating that they fit the data well. The ROC curve calculates the true-positive rate against the false-positive rate for all possible cutpoints (ranging from 0 to 1). ROC values of all models in Table 4-1 range from .828 to .829,

indicating a fair/good model fit. These results suggest that oil should be considered to predict the likelihood of a coup attempt.

4.7 Conclusion

This paper explores the relationship between oil and coup risk. The influences of oil on coup risk can be classified into three groups: the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. I argue that each aspect of oil has different effects on coup risk. First, oil revenues are likely to reduce coup risk. Political leaders in an oil-funded state may spend more money to dampen social grievances and to increase the legitimacy of the current government, and may invest in the military to make structural obstacles, such as military size and fractionalization. This implies that oil revenues reduce expected payoffs of an attempted coup and the perceived probability of a coup's success. Second, oil reserves are likely to increase coup risk. Because oil reserves in a state as potential rents are likely to increase the value of capturing the state, potential coup plotters in the state are more likely to staging a coup and greedy third parties are likely to send hostile signals to its government to seek a new opportunity to obtain benefits from the oil reserves. Third, oil trade ties are likely to reduce coup risk. Because of the exporter-favored international oil trade market structure, including few exporters and numerous importers, and the importance of oil as a primary energy source, the break of an oil trade tie generates much higher costs to oil-importing states. Thus, if an oil-exporting state has a political instability problem that risks a coup and a subsequent break in its oil trade ties, oil-importing states are apt to send supportive signals to its government and intervene in the exporter to protect the government to avoid bearing costs from the break. This possibility should decrease the anticipated payoffs of a coup attempt and the perceived probability of a coup's success.

The empirical results provide three implications for the effects of oil on coup risk. First, oil is an important factor of a coup attempt. The empirical results reveal that higher oil reserves increase the

likelihood of a coup, though this effect is dwarfed by the negative influence of a state's oil trade ties on coup risk. This implies that oil in a state significantly affects the decision of coup plotters to stage a coup. However, although the empirical results reveal that oil revenues decrease the likelihood of a coup, the effect of oil revenues are not statistically significant. This implies that the level of oil revenues does not significantly affect the decision of a regime to spend money to dampen social grievances or to invest in the military to reduce coup risk.

Second, the effect of oil reserves is a conditional effect. Because the higher level of the effect of a state's oil trade ties increases the likelihood of supportive signals from external actors, the state's oil trade ties are likely to make costs of coup plotters' coup attempt higher than the value of capturing the state and increase costs of greedy third parties intervention to benefit from the oil reserves.

Third, empirical results of this study support arguments of prior studies on coup risk. The level of democracy and regime types are important factors of coup risk. An anocracy and a military regime have the higher likelihood of a coup attempt because the regime types do not sufficiently have the ability to address social grievances or repress oppositions or have the lower level of legitimacy. The bigger size of a military as a structural obstacle to hinder collective actions in the military may reduce the likelihood of a coup attempt. Also, prior studies have argued that economic performances are important factors of coup risk. Empirical results of this study also support that the higher level of economic growth significantly reduces the likelihood of a coup attempt. This implies that economic performances are important factors of the level of legitimacy.

This research provides two implications. First, oil can affect both legal and illegal attempts that weaken political stability. Although the oil curse literature focuses on how oil affects democratization and civil war, this study reveals that oil also affects coup risk. This implies that oil more widely affects a state's political instability problems, including both legal and illegal attempts, than what prior studies have dealt with. However, the effect of oil on political stability is more complicated. Although prior studies have argued that oil either improve or weaken a state's political stability, this study reveals that oil

reserves are likely to weaken political stability while oil trade ties can improve political stability. Thus, we should specify the effect of oil on political stability, and should consider how oil affects both domestic and external actors. Second, this study suggests that an oil-exporting state's oil trade ties can attract supportive signals from oil-importing state to its government. This implies that energy policies can be important factors of international relations. Because an oil-exporting state's ability to attract external support is derived from the exporter-favored structure of the international oil market and the importance of oil as a primary energy source, an oil-importing state's energy policy, which decrease reliance on oil, can reduce the exporter's leverage over the importer. For example, because oil-importing states' renewable energy development policies may both allow the importers to avoid the exporter-favored market structure and reduce the importance of oil as a primary energy source, they can reduce an oil-exporting state's ability to attract external support. This can shed light on the importance of each state's energy policies in international relations.

5. Epilogue

Although a large literature in political science deals with the effect of oil on political instability, these studies have primarily focused on how oil affects domestic actors' decision making. However, this only explains part of the story. For example, the Arab Spring revealed that if we focus only on the effect of oil on domestic actors, we cannot explain why some oil-producing states in MENA experienced severe political instability problems while other oil-producing states did not face them. In this project, I have focused on how a state's oil affects international actors' decision making and how the international actors' decisions affect the state's political instability problems. I began by expanding prior studies in three ways. First, I classified the effect of oil on political instability into three categories: the effect of oil revenues, the effect of oil reserves, and the effect of oil trade ties. I emphasized the effect of oil trade ties that prior studies have rarely focused on. The effect of oil trade ties is derived from two characteristics of the international oil trade market: the value of oil as a primary energy source and the exporter-favored structure of the international oil trade market. That is, most states need oil as a primary energy source, and their economies can be significantly damaged if they fail to import enough oil. However, because a few states can produce and export quality oil to other states, it is difficult to find an alternative oil trade partner when oil importing states face the break of their oil trade ties. This implies that oil-importing states are likely to avoid the break of oil trade ties and, thus, when an oil-exporting state makes a demand, the importers should comply to avoid the break. Thus, oil trade ties of an oil-exporting state can be unintentional or intentional strategic tools to reduce international pressures and attract external support for its political stability.

Second, in order to specify and measure the effect of an oil-exporting state's oil trade ties on external actors, I decompose oil trade ties into three components: depth, breadth, and closeness. The depth of an oil-exporting state's oil trade ties is the total oil amount of a state's oil trade ties, which captures

costs of breaking an oil trade tie. The breadth of an oil-exporting state's oil trade ties is its number of oil trade partners, capturing how many states the oil exporter can reduce external pressures from or attract external support from by using its oil trade ties as strategic tools. The closeness of oil trade ties is the level of a state's oil trade proximity to all other states, emphasizing the indirect role the indirect role that oil trade ties can play. This captures the ability of an oil-exporting state to indirectly resist external pressures or attract external support by using its leverage over the entire international oil trade market. In order to simultaneously examine the effect of these three components on political stability, I employed closeness centrality in weighted networks of social network analysis. The closeness centrality in weighted networks allows us to more accurately examine the effect of a state's oil trade ties on political stability.

Third, I analyzed the effect of oil trade ties on three political instability phenomena: democratization, civil war onset, and coups d'état. Although prior studies on democratization or civil war onset have argued that oil plays a significant role in the phenomena, their empirical results have not been consistent. For example, although a large literature's empirical results support the idea that oil is likely to hinder democratization (e.g. Ross 2013), Dunning (2008) and Haber and Menaldo (2011) suggested that oil does not have significant influences on democratization. Also, while Collier and Hoeffler (2006) and Hegre (2002) showed that higher natural resource revenues are likely to cause civil war outbreak, Elbadawi and Sambanis (2002) revealed weak or no effect of natural resource revenues. I argue that the reason empirical results of prior studies are not consistent is that prior studies have provided an insufficient focus on oil trade ties as an oil-exporting state's strategic tool to resist external pressures and attract external support. In this project, empirical results reveal that oil trade ties are important factors that hinder democratization and attract pre-war external support. In addition, I analyzed the effect of an oil-exporting state's oil trade ties on coup risk. Prior studies have rarely focused on coups d'état, which have been understood as another important political instability problem. This project extends the research on the effect of oil on political instability into another political instability phenomenon by explaining how oil

affects coup risk.

In Chapter 2, I argued that oil trade ties of autocratic oil-exporting states with democratic importers are likely to improve the ability of the autocratic exporters to resist external democratizing pressures. Specifically, if an autocratic state exports oil to more states or is able to more strongly affect all states in the international oil market, it will be more likely to avoid democratization. In addition, characteristics of oil importers may affect the ability of an autocratic exporter's oil trade ties to resist democratization. If an autocratic state exports oil to more democratic states or states that import oil from more states, the ability of oil trade ties to resist external democratizing pressures is reduced. However, if an autocratic state exports oil to states with a high reliance on oil, the ability of oil trade ties increases. The empirical results revealed that oil trade ties of an autocratic oil exporter hinder democratization. If an autocratic state exports oil to more states or is able to more strongly affect all states in the international oil market, it will be more likely to avoid democratization. In addition, characteristics of oil importers may affect the ability of an autocratic exporter's oil trade ties to resist democratization. If an autocratic state exports oil to more democratic states or states that import oil from more states, the ability of oil trade ties to resist external democratizing pressures is reduced. However, if an autocratic state exports oil to states with a high reliance on oil, the ability of oil trade ties increases.

In Chapter 3, I argued that an oil-exporting state's oil trade ties are likely to attract external support for its government because their oil trade partners try to avoid the break of their oil trade ties caused by the onset of civil war. In addition, I argue that the effect of an oil-exporting state's oil trade ties on civil war onset depends on the existence of external support for its government side. That is, if an external actor supports an oil-exporting state's government, the government and rebel sides would be certain that oil-importing states may support the government to protect their oil trade ties with the exporter. Thus, the presence of external support for an oil-exporting state's government allows its oil trade ties to reduce information problems and the likelihood of civil war. However, if there is no external

support for an oil-exporting state's government, its oil trade ties would cause information problems because the government can expect external support from its oil trade partners based on perfect information about its oil trade ties, while the rebel side is difficult to obtain information about the oil trade ties and, thus, is able to miscalculate the likelihood of external support for the government. The information problems may cause the bargaining failure between the government and rebels. The empirical results provided two implications. First, oil trade ties of an oil-exporting state with a political instability problem are likely to encourage oil-importing states to support its government to avoid the break of their oil trade ties. However, oil trade ties of oil-exporting states do not significantly affect third parties' support for the potential rebel group and neutral prewar intervention. Second, the effect of an oil-exporting state's oil trade ties on the likelihood of civil war onset depends on the existence of external support for its government. If an external actor supports the government side of an oil-exporting state, its oil trade ties do not cause information problems. However, the absence of external support for the government side of an oil-exporting state encourage its oil trade ties to cause information problems and, thus, increase the likelihood of civil war.

In Chapter 4, I argue that oil trade ties are likely to reduce coup risk. If an oil-exporting state has a political instability problem that risks a coup and a subsequent break in its oil trade ties, oil-importing states are apt to send supportive signals to its government and intervene in the exporter to protect the government to avoid costs from the break. This possibility should decrease the anticipated payoffs of a coup attempt and the perceived probability of a coup's success. The empirical results revealed that an oil-exporting state's oil trade ties are likely to reduce coup risk. In order to avoid the break of oil trade ties, oil-importing states are apt to send supportive signals to an oil-exporting state's government and intervene in the exporter to protect its government. This possibility should decrease the anticipated payoffs of a coup attempt and the perceived probability of a coup's success. In addition, the effect of an oil-producing state's oil reserves on coup risk is conditional on its oil trade ties. Because the higher level of the effect of

a state's oil trade ties increases the likelihood of supportive signals from external actors and oil-importing states are more willing to protect their potential benefits from the exporter's oil reserves, the exporter's oil trade ties are likely to make costs of coup plotters' coup attempt higher than the value of capturing the state and increase intervention costs of greedy third parties to benefit from the oil reserves.

The arguments and empirical findings of this projects suggest three implications for researchers and policy makers. First, I highlight that the effect of oil on political stability phenomena is more complicated than what prior studies have dealt with. Especially, an oil-exporting state's oil trade ties affects external actors' decision making, which then affects the oil-exporter's domestic politics. As I stated, the importance of oil as a primary energy source and the exporter-favored structure of the international oil market are likely to make oil-importing states sensitive to the break of their oil trade ties. This characteristic of an oil trade tie explains how an oil-exporting state can reduce international pressures and attract external support. Empirical results in this project support this argument, and reveal that we should better specify the effect of oil on political phenomena, particularly its effect on international actors. The likely reason that empirical results from prior studies are inconsistent is that they have rarely focused on this effect. Particularly, because most states' political stability are not perfectly irrelevant to international pressures or support, the effect of an oil-exporting state's oil trade ties on international actors should be considered.

Second, this project implies that in order to analyze the effect of trade ties on political phenomena we should consider a state's specific trade ties rather than trade share. A state can use its trade tie with a target as a strategic tool to make a demand, particularly when the break of the trade ties will generate low costs that the state can bear but make high costs that the target cannot bear. In the international oil trade market, because of the importance of oil and the exporter-favored market structure, the break of an oil trade tie can cause high costs to an oil-importing state but not high costs to an oil-exporting state. Thus, oil-exporting states can use their oil trade ties as their strategic tools. However, if a

state exports something less important (e.g., toys or clothes) to a target, the break of the trade tie would not cause significant costs to the target and, thus, the tie would not be the state's strategic tool. This implies that if we focus on a total trade between two states, we might not correctly measure the effect of economic interdependence because costs generated by the break of a trade tie between two states are determined not only by the tie's trade share but also characteristics of the two states' trade ties, including what they trade with each other, the products' fungibility, and its the international market structure. Thus, in order to more correctly analyze the effect of economic interdependence, we should consider specific trade ties between two states.

Third, this projects reveals the importance of energy policies in international relations. The ability of an oil-exporting state to resist international pressures and attract external support is derived from the exporter-favored structure of the international oil market and the importance of oil as a primary energy source. This implies that energy policies of oil-importing states can reduce oil-exporting states' strategic abilities derived from their oil trade ties in three ways. If oil-importing states use more renewable energy and reduce their reliance on oil, the importance of oil as a primary energy source would decrease and the break of an oil trade ties would be less likely to cause high costs that an oil-importing state cannot bear. Thus, the use of renewable energy sources can be both environmentally and strategically valuable. In addition, the discovery of new oil fields and the development of new oil drilling technologies can reduce an oil-exporting state's ability to weaken external pressures and attract external support. For example, after the 1979 oil crisis, many oil-exporting states lost their influences in the international oil market because North Sea and Alaskan oil flooded the market.²⁶ Also, after the United States has explored shale oil and its domestic crude oil production has nearly doubled in the 2010's, oil prices has been dropping fast and some oil-exporting states' political stability has been decreasingly

²⁶ In 1975, for example, the United Kingdom (the U.K.) produced about 1.6 metric tons of crude oil. In 1982, the U.K. produced over 103 metric tons of crude oil (GOV.UK 2014).

weakened (Krauss 2015). These cases reveal that the discovery and exploration of new oil fields and the development of new oil drilling technologies can change the structure of the international oil market and oil-exporting states' power in international relations. That is, renewable energy development policies help not only to reduce environmental problems but also facilitate democratization in autocratic oil-exporting states, especially states in Middle East and North Africa.

However, as stated in Chapter 2, this project has a limitation. Although main oil-importing states open data about their oil trade ties, many oil-exporting states, particularly autocratic oil-exporting states, try to conceal the information about their oil trade. Thus, the oil trade dataset of this study does not perfectly cover all oil trade ties, especially oil trade ties between autocracies. In addition to this, the oil trade dataset covers the period from 1986 to the current period. Because political instability phenomena have always occurred, the empirical results in this project may examine the effect of an oil-exporting state's oil trade ties on its political instability, but may not reveal the long term trend of oil trade ties' effect. Despite these limitations, this study provides a solid first step to better understanding of the effect of oil on political instability.

Bibliography

- Acemoglu, Daron, and James Robinson. 2006. *Economic Origins of Dictatorship and Democracy*. New York: Cambridge University Press.
- Alesina, Alberto, Arnaud Devleschauer, William Easterly, Sergio Kurlat, and Romain Wacziarg. 2003. "Fractionalization." *Journal of Economic Growth* 8: 155-194.
- Andersen, Jørgen Juel, and Silje Aslaksen. 2013. "Oil and Political Survival." *Journal of Development Economics* 100 (Jan.):89-106.
- AP. 1992. "Venezuela Crushes Army Coup Attempt." *New York Times*, February 5, A10.
- Aslaksen, Silje. 2010. "Oil and Democracy: More than a Cross-Country Correlation?" *Journal of Peace Research* 47 (Jul.): 421-431.
- Basedau, Matthias and Jann Lay. 2009. "Resource Curse or Rentier Peace? The Ambiguous Effects of Oil Wealth and Oil Dependence on Violent Conflict." *Journal of Peace Research* 46(Nov.): 757-776.
- Beblawi, Hazem, and Giacomo Luciani. 1987. *The Rentier State*. New York: Croom Helm.
- Beck, Nathaniel. 2001. "Time-Series—Cross-Section Data: What Have We Learned in the Past Few Years?" *Annual Review of Political Science* 4: 271-93.
- Belkin, Aaron, and Evan Schofer. 2003. "Toward a Structural Understanding of Coup Risk." *Journal of Conflict Resolution* 47 (5): 594-620.
- Bell, Curtis, and Scott Wolford. 2014. "Oil Discoveries, Shifting Power, and Civil Conflict." *International Studies Quarterly*. Forthcoming.
- Bellin, Eva. 2004. "The Robustness of Authoritarianism in the Middle East: Exceptionalism in

- Comparative Perspective.” *Comparative Politics* 36 (2): 139-157.
- Besley, Timothy, and James Robinson. 2010. “Quis Custodiet Ipsos Custodes? Civilian Control over the Military.” *Journal of the European Economic Association* 8 (2-3): 655-663.
- Bevan, David L., Paul Collier, and Jan Willem Gunning. 1999. *Nigerian and Indonesia*. New York: Oxford University Press.
- Boix, Carles. 2011. “Democracy, Development, and the International System.” *The American Political Science Review* 105 (Nov.): 809-828.
- Boix, Carles, and Susan Stokes. 2003. “Endogenous Democratization.” *World Politics* 55 (July): 517-49.
- Borgatti, Stephen P. 2005. “Centrality and Network Flow.” *Social Networks* 27 (1): 55-71.
- Box-Steffensmeier, Janet, and Bradford Jones. 2004. *Event History Modeling: A Guide for Social Scientists*. Cambridge: Cambridge University Press.
- Brambor, Thomas, William R. Clark, and Matt Golder. 2006. “Understanding Interaction Models: Improving Empirical Analyses.” *Political Analysis* 14: 63-82.
- British Petroleum. 2014. “BP Statistical Review of World Energy.” June. <http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf> (Feb 9, 2015).
- Carter, David B., and Curtis S. Signorino. 2010. “Back to the Future: Modeling Time Dependence in Binary Data.” *Political Analysis* 18 (Jun.): 271-292.
- Cetinyan, Rupen. 2002. “Ethnic Bargaining in the Shadow of Third-Party Intervention.” *International Organization* 56 (3): 645-677.
- Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2010. “Democracy and

- Dictatorship Revisited.” *Public Choice* 143 (1/2): 67-101.
- Colgan, Jeff D. 2014. “Oil, Domestic Conflict, and Opportunities for Democratization.” *Journal of Peace Research*. Forthcoming.
- Collier, Paul, and Anke Hoeffler. 2004. “Greed and Grievance in Civil Wars.” *Oxford Economic Papers* 56 (Oct.): 563-595.
- Collier, Paul, and Anke Hoeffler. 2006. “The Political Economy of Secession.” In *Negotiating Self-determination*, eds. Hurst Hannum and Eileen Babbitt. Lanham, MD: Lexington Books, 37-60.
- Collier, Paul, and Anke Hoeffler. 2007. “Military Spending and the Risks of Coup D’état.” Oxford University. Mimeo.
- Crescenzi, Mark J. C. 2003. “Economic Exit, Interdependence, and Conflict.” *The Journal of Politics* 65 (Aug.): 809-832.
- Cuaresma, Jesus Crespo, Harald Oberhofer, and Paul Raschky. 2011. “Oil and the Duration of Dictatorships.” *Public Choice* 148 (Sep.): 505-530.
- Cunningham, David E. 2006. “Veto Players and Civil War Duration.” *American Journal of Political Science* 50(4):875-892.
- Cunningham, David E. 2010. “Blocking Resolution: How External States Can Prolong Civil Wars.” *Journal of Conflict Resolution* 47(2):115-127.
- Decalo, Samuel. 1990. *Coups and Army Rule in Africa: Motivations and Constraints*. 2nd ed. New Haven, CT: Yale University Press.
- Delacroix, Jacques. 1980. “The Distributive State in the World System.” *Studies in Comparative International Development* 15 (Fall): 3-20.

- de Soysa, Indra. 2002. "Paradise is a Bazaar? Greed, Creed, and Governance in Civil War, 1989-99." *Journal of Peace Research* 39 (Jul.): 395-416.
- Dizaji, Sajjad Faraji, and Peter A. G. van Bergeijk. 2013. "Potential Early Phase Success and Ultimate Failure of Economic Sanctions: A VAR Approach with an Application to Iran." *Journal of Peace Research* 50 (6): 721-736.
- Dunning, Thad. 2008. *Crude Democracy: Natural Resource Wealth and Political Regimes*. New York: Cambridge University Press.
- Elbadawi, Ibrahim, and Nicholas Sambanis. 2002. "How Much War Will We See? Explaining the Prevalence of Civil War." *Journal of Conflict Resolution* 46 (June): 307-334.
- Entetelis, John P. 1976. "Oil Wealth and the Prospects for Democratization in the Arabian Peninsula: The Case of Saudi Arabia." In *Arab Oil: Impact on the Arab Countries and Global Implications*, ed. Naiem A. Sherbbiny and Mark A. Tessler. New York: Praeger, 77-111.
- Fearon, James D., and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97 (Feb.): 75-90.
- Findley, Michael G., and Tze Kwang Teo. 2006. "Rethinking Third-Party Interventions into Civil Wars: An Actor-Centric Approach." *The Journal of Politics* 68 (4): 828-837.
- First, Ruth. 1970. *The Barrel of a Gun: Political Power in Africa and the Coup d'état*. London: Penguin Press.
- Forero, Juan. 2004. "Documents Show C.I.A. Knew Of a Coup Plot in Venezuela." *New York Times*, December 3.
- Frantz, Erica, and Natasha Ezrow. 2011. *The Politics of Dictatorship*. Boulder, CO: Lynne Rienner.

- Gartzke, Erik. 2003. Signaling and the Liberal Peace. Manuscript, Columbia University.
- Geddes, Barbara. 1999. Authoritarian Breakdown: Empirical Test of a Game Theoretic Argument. Paper prepared for the annual meeting of the American Political Science Association, Atlanta, GA, September.
- Geddes, Barbara, Joseph Wright, and Erica Frantz. 2014. "Autocratic Breakdown and Regime Transitions: A New Data Set." *Perspectives on Politics* 12 (2): 313-331.
- Gedicks, Al. 2001. *Resource Rebels: Native Challenges to Mining and Oil Corporations*. Cambridge, Mass.: South End Press.
- Gibler, Douglas M. 2009. *International military alliances, 1648-2008*. Thousand Oaks, CA: CQ Press.
- Gladstone, Rick. 2012. "India Explores Economic Opportunities in Iran, Denting Western Sanctions Plan." *New York Times*, February 10, 7.
- Gleditsch, Kristian Skrede. 2002a. *All International Politics Is Local: The Diffusion of Conflict, Integration, and Democratization*. Ann Arbor: University of Michigan Press.
- Gleditsch, Kristian Skrede. 2002b. "Expanded Trade and GDP Data." *Journal of Conflict Resolution* 46 (5):712-24.
- Gleditsch, Kristian Skrede. 2007. "Transnational Dimensions of Civil War." *Journal of Peace Research* 44 (3): 293-309.
- Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg, and Håvard Strand. 2002. "Armed Conflict 1946-2001: A New Dataset." *Journal of Peace Research* 39 (Sep.): 615-637.
- Gleditsch, Kristian Skrede, and Michael Ward. 2006. "Diffusion and the International Context of

- Democratization.” *International Organization* 60 (4): 911-933.
- Goldstone, Jack A., Robert H. Bates, David L. Epstein, Ted Robert Gurr, Michael B. Lustik, Monty G. Marshall, Jay Ulfelder, and Mark Woodward. 2010. “A Global Model for Forecasting Political Instability.” *American Journal of Political Science* 54 (1): 190-208.
- Gowa, Joanne. 1994. *Allies, Adversaries, and Applied Economists*. Princeton, NJ: Princeton University Press.
- Haber, Stephen, and Victor Menaldo. 2011. “Do Natural Resource Fuel Authoritarianism?: A Reappraisal of the Resource Curse.” *American Political Science Review* 105 (Feb.): 1-26.
- Hegre, Håvard. 2002. “Some Social Requisites of a Democratic Civil Peace: Democracy, Development, and Armed Conflict.” Presented at the Annual Meeting of the American Political Science Association, Boston.
- Herb, Michael. 2005. “No Representation without Taxation? Rents, Development, and Democracy.” *Comparative Politics* 37 (Apr.): 297-316.
- Hirschman, Albert. 1945. *National Power and the Structure of Foreign Trade*. Berkeley and Los Angeles: University of California Press.
- Hosmer, David W., and Stanley Lemeshow. 2000. *Applied Logistics Regression*. New York: Wiley.
- Humphreys, Macartan. 2005. “Natural Resources, Conflict, and Conflict Resolution: Uncovering the Mechanisms.” *Journal of Conflict Resolution* 49 (Aug.): 508-537.
- Huntington, Samuel P. 1990. *The Third Wave: Democratization in the Late Twentieth Century*. Norman: University of Oklahoma Press.
- International Energy Agency. 1986-1996. *Oil and Gas Information*. Paris: International Energy

Agency.

International Energy Agency. 1997-2013. *Oil Information*. Paris: International Energy Agency.

International Energy Agency. 2014a. "Energy Balance Flows." <http://www.iea.org/Sankey/index.html> (accessed July 15, 2014).

International Energy Agency. 2014b. "Key World Energy Statistics 2014." <http://www.iea.org/publications/freepublications/publication/KeyWorld2014.pdf> (accessed September 15, 2014).

Keohane, Robert, and Joseph Nye. 1989. *Power and Interdependence*. Glenview, IL: Scott Foresman.

Kessler, Timothy P. 1999. *Global Capital and National Politics: Reforming Mexico's Financial System*. Westport, Conn.: Praeger.

Khan, Shirley A. 2009. *U.S.-China Counterterrorism Cooperation: Issues for U.S. Policy*. Darby, PA: DIANE Publishing.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44 (2): 347-361.

King, Gary, and Langche Zeng. 2001. "Improving Forecasts of State Failure." *World Politics* 53(4): 623-658.

Kinne, Brandon J. 2012. "Multilateral Trade and Militarized Conflict: Centrality, Openness, and Asymmetry in the Global Trade Network." *Journal of Politics* 74 (1): 308-322.

Klare, Michael T. 2001. *Resource Wars: The New Landscape of Global Conflict*. New York: Metropolitan Books.

Krauss, Clifford. 2015. "Oil Prices: What's Behind the Drop? Simple Economics." *New York Times*, April

- Leon, Gabriel. 2011. "The Economic Causes of Coups." University of Cambridge. Mimeo.
- Levitsky, Steven, and Lucan A. Way. 2010. *Competitive Authoritarianism: Hybrid Regimes after the Cold War*. Cambridge: Cambridge University Press.
- Linz, Juan J., and Alfred Stepan. 1996. *Problems of Democratic Transition and Consolidation*. Baltimore: Johns Hopkins University Press.
- Londregan, John, and Keith Poole. 1990. "Poverty, the coup trap, and the seizure of executive power." *World Politics* 42 (2): 151-183.
- Lujala, Päivil, Nils Petter Gleditsch, and Elisabeth Gilmore. 2005. "A Diamond Curse? Civil War and a Lootable Resource." *The Journal of Conflict Resolution* 49 (Aug.): 538-562.
- Maoz, Zeev. 2009. "The Effects of Strategic and Economic Interdependence on International Conflict Across Levels of Analysis." *American Journal of Political Science* 53 (Jan.): 223-240.
- Maoz, Zeev, Lesley G. Terris, Ranan D. Kuperman, and Ilan Talmud. 2007. "Network Centrality and International Conflict: Does it Pay to Be Important?" In *Applications of Social Networks Analysis*, ed. Thomas N. Friemel. Konstanz, Germany: Universitat Verlag Konstanz, 121-151.
- Marinov, Nikolay. 2005. "Do Economic Sanctions Destabilize Country Leaders?" *American Journal of Political Science* 2005 (Jul.): 564-576.
- Marinov, Nikolay, and Hein Goemans. 2013. "Coups and Democracy," *British Journal of Political Science* 44 (4): 799-825.
- Marshall, Monty G. 1999. *Third World War*, Lanham, MD: Rowman & Littlefield.
- Marshall, Monty, and Keith Jagers. 2008. "Polity IV Project: Political Regime Characteristics and

- Transitions, 1800-2006.” University of Maryland. Unpublished manuscript.
- Morrison, Kevin M. 2009. “Oil, Nontax Revenue, and the Redistributive Foundations of Regime Stability.” *International Organization* 63 (Jan.): 107-138.
- Najmabadi, Afsaneh. 1987. “Depoliticisation of a Rentier State: the case of Pahlavi Iran.” In *The Rentier State*, ed. Hazem Beblawi and Giacomo Luciani. London: Croom Helm, 211-270.
- Opsahl, Tore. 2009. “Structure and Evolution of Weighted Networks.” PhD dissertation. University of London (Queen Mary College). Online: <http://toreopsahl.com/publications/thesis/>.
- Opsahl, Tore, Filip Agneessens, and John Skvoretz. 2010. “Node Centrality in Weighted Networks: Generalizing Degree and Shortest Paths.” *Social Networks* 32 (3) 245-251.
- Pilster, Ulrich, and Tobias Böhmelt. 2012. “Do Democracies Engage Less in Coup-Proofing? On the Relationship between Regime Type and Civil-Military Relations.” *Foreign Policy Analysis* 8 (4): 355-372.
- Pollack, Kenneth. 2002. *Arabs at War: Military Effectiveness, 1948-1991*. Lincoln: University of Nebraska Press.
- Powell, Jonathan. 2012. “Determinants of the Attempting and Outcome of Coups d’état.” *Journal of Conflict Resolution* 56 (6): 1017-1040.
- Powell, Jonathan, and Clayton Thyne. 2011. “Global Instances of Coups from 1950-2010: A New Dataset.” *Journal of Peace Research* 48 (3): 249-259.
- Przeworski, Adam, Jos’e Cheibub, and Fernando Limongi. 2000. *Democracy and Development*. New York: Cambridge University Press.
- Przeworski, Adam, and Fernando Limongi. 1997. “Modernization: Theories and Facts.” *World Politics* 49

(2): 155–83.

Quinlivan, James T. 1999. “Coup-Proofing: Its Practice and Consequences in the Middle East.”

International Security 24 (2): 131-165.

R Development Core Team. 2014. *R: A Language and Environment for Statistical Computing*. Vienna,

Austria: R Foundation for Statistical Computing. Online: <http://www.R-project.org>.

Regan, Patrick M. 1996. “Conditions of Successful Third-Party Intervention in Intrastate Conflicts.”

Journal of Conflict Resolution 40 (2): 336-359.

Regan, Patrick M. 2000. *Civil Wars and Foreign Powers: Outside Intervention in Intrastate Conflict*.

Ann Arbor, MI: University of Michigan Press.

Regan, Patrick M., and M. Scott Meachum. 2014. “Data on Intervention during Periods of Political

Instability.” *Journal of Peace Research* 51 (1): 127-135.

Ross, Michael L. 2001. “Does Oil Hinder Democracy?” *World Politics* 53 (Apr.): 325-361.

Ross, Michale L. 2003. “Oil, Drugs, and Diamonds: How Do Natural Resources Vary in Their Impact on

Civil War?” In *Beyond Greed and Grievance: The Political Economy of Armed Conflict*, ed.

Karen Ballentine and Jake Sherman. Boulder, CO: Lynne Rienner.

Ross, Michael L. 2004. “How Do Natural Resources Influence Civil War? Evidence from Thirteen

Cases.” *International Organization* 58 (Winter): 35-67.

Ross, Michael L. 2005. “Booty Futures.” Working Paper, University of California, Los Angeles.

Ross, Michael L. 2009. “Oil and Democracy Revisited.” University of California-Los Angeles. Mimeo.

Ross, Michael L. 2013. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*.

Princeton, NJ: Princeton University Press.

- Sarkees, Meredith Reid and Frank Wayman. 2010. *Resort to War: 1816 - 2007*. Thousand Oaks, CA: CQ Press.
- Singer, J. David, Stuart Bremer, and John Stuckey. 1972. "Capability Distribution, Uncertainty, and War, 1820-1965." In *Peace, War and Numbers*, edited by Bruce Russett, 19-48. Beverly Hills, CA: Sage.
- Skocpol, Theda. 1982. "Rentier State and Shi'a Islam in the Iranian Revolution." *Theory and Society* 11 (May): 265-82.
- Smith, Benjamin. 2004. "Oil Wealth and Regime Survival in the Developing World, 1960-1999." *American Journal of Political Science* 48 (Apr.): 232-246.
- Snyder, Richard, and Rabi Bhavnani. 2005. "Diamonds, Bloods, and Taxes: A Revenue-Centered Framework for Explaining Political Order." *Journal of Conflict Resolution* 49 (Aug.): 563-597.
- Søril, Mirjam E., Nils Petter Gleditsch, and Håvard Strand. 2005. "Why Is There So Much Conflict in the Middle East?" *Journal of Conflict Resolution* 49 (Feb.): 141-165.
- Stern, Jonathan. 2006. "The New Security Environment for European Gas: Worsening Geopolitics and Increasing Global Competition for LNG." <http://www.oxfordenergy.org/2006/10/the-new-security-environment-for-european-gas-worsening-geopolitics-and-increasing-global-competition-for-lng/> (September 1, 2014).
- Stinnett, Douglas M., Jaroslav Tir, Philip Schafer, Paul F. Diehl, and Charles Gochman. 2002. "The Correlates of War Project Direct Contiguity Data, Version 3." *Conflict Management and Peace Science* 19 (2):58-66.
- Svolik, Milan W. 2009. "Power Sharing and Leadership Dynamics in Authoritarian Regimes." *American Journal of Political Science* 53 (2): 477-494.

- The Government of United Kingdom. 2015. "Crude oil and petroleum: production, imports and exports 1890 to 2013." <https://www.gov.uk/government/statistical-data-sets/crude-oil-and-petroleum-production-imports-and-exports-1890-to-2011> (April 30, 2015).
- Thompson, William R. 1973. *Grievances of Military Coup-Makers*. Beverly Hills, CA: Sage.
- Thyne, Clayton L. 2009. *How International Relations Affect Civil Conflict: Cheap Signals, Costly Consequences*. Lexington, MA: Lexington Books.
- Tomz, Michael, Jason Wittenberg, and Gary King. 2003. *Clarify: Software for Interpreting and Presenting Statistical Results. Version 2.1*. Available at <http://gking.harvard.edu>: Stanford University, University of Wisconsin, and Harvard University.
- Ulfelder, Jay. 2007. "Natural-Resource Wealth and the Survival of Autocracy." *Comparative Political Studies* 40 (Aug.): 995-1018.
- U.S. Energy Information Administration. 2015a. "International Energy Statistics: Petroleum Reserves." <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=57&aid=6> (Feb. 1, 2015).
- U.S. Energy Information Administration. 2015b. "International Energy Statistics: Petroleum Production." <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=5&pid=53&aid=1&cid=regions&syid=1981&eyid=2014&unit=TBDP> (May. 1, 2015).
- U.S. Energy Information Administration. 2015c. "U.S. Imports from Venezuela of Crude Oil and Petroleum Products." http://www.eia.gov/dnav/pet/hist_xls/MTTIMUSVE1a.xls (Feb. 1, 2015).
- Vandewalle, Dirk. 1998. *Libya Since Independence: Oil and State Building*. Ithaca: Cornell University Press.
- Vreeland, James Raymond. 2008. "The Effect of Political Regime on Civil War: Unpacking Anocracy.

- Journal of Conflict Resolution* 52 (3): 401-425.
- Walter, Babara F. 2009. "Bargaining Failures and Civil War." *Annual Review of Political Science* 12: 243-261.
- Wasserman, Stanley and Katherine Fraust. 1997. *Social Network Analysis: Methods and Applications*. 2nd ed. Cambridge: Cambridge University Press.
- Weeks, Jessica. 2008. "Autocratic Audience Costs: Regime Type and Signaling Resolve." *International Organization* 62 (1): 35-64.
- Wig, Tore, and Espen Geelmuden Rød. 2012. "Cues to Coup Plotters: Elections as Coup Triggers in Dictatorships." University of Oslo. Mimeo.
- Wiking, Staffan. 1983. *Military Coups in Sub-Saharan Africa: How to Justify Illegal Assumptions of Power*. Uppsala, Sweden: Scandinavian Institute of African Studies.
- Williamson, Oliver. 1996. *The Mechanisms of Governance*. New York: Oxford University Press.
- Wilson, Seven E., and Daniel M. Butler. 2007. "A Lot More to Do: the Sensitivity of Time-Series Cross-Section Analyses to Simple Alternative Specifications." *Political Analysis* 15 (2): 101-123.
- Wines, Michael. 2012. "China Balks as Geithner Presses for Iran Curbs." *New York Times*, January 12, 6.
- World Bank. 2014. "World Development Indicators Data." <http://data.worldbank.org/> (accessed Aug. 19, 2014).
- Wright, Joseph, Erica Frantz, and Barbara Geddes. "Oil and Autocratic Regime Survival." *British Journal of Political Science*. Forthcoming.

Appendix

1. Organization for Economic Co-operation and Development members and their trade partners
 - i. International Energy Agency. 1986-1996. *Oil and Gas Information*. Paris: International Energy Agency.
 - ii. International Energy Agency. 1997-2013. *Oil Information*. Paris: International Energy Agency.
2. Main oil exporters and importers
 - i. United Nations. 1986-2010. *Energy Statistics Yearbook*. New York: United Nations, Department of Economic and Social Affairs.
3. China
 - i. China Energy Group. 2014. "China Energy Databook Version 8.0." <http://china.lbl.gov/research-areas/china-energy-databook> (accessed Jul. 15, 2014).
4. Japan
 - i. Petroleum Association of Japan. 2014. "Crude Oil Import by Countries and by Source." http://www.paj.gr.jp/english/statis/data/04/paj-4E_201409.xls (accessed Jul. 15, 2014).
5. South Africa
 - i. South African Petroleum Industry Association. 1995-2013. "SAPIA Annual Report." <http://www.sapia.co.za/publications/annual-reports.html> (accessed Jul. 15, 2014).
6. South Korea
 - i. Korea National Oil Corporation. 2014. "National Petroleum Information: Import/Export Information." <http://www.petronet.co.kr/main2.jsp> (accessed Jul. 15, 2014).
7. Taiwan
 - i. Taiwan Ministry of Economic Affairs. 2014. "Energy Statistical Annual Reports: Value and Quantity of Imported Crude Oil to Taiwan Area." http://web3.moeaboe.gov.tw/ECW/english/content/wHandMenuFile.ashx?menu_id=2020 (accessed Jul. 15, 2014).
8. United States
 - i. United State Energy Information Administration. 2014. "U.S. Net Imports by Country." http://www.eia.gov/dnav/pet/pet_move_net_i_a_ep00_IMN_mbbldpd_a.htm (accessed Jul. 15, 2014).

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