Beyond Vulnerability: Explaining State Intervention in Oil Supply in Asia-Pacific

A thesis submitted for the degree of Doctor of Philosophy of the Australian National University

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I certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

The politics of oil will remain a central element of international economics and security for years to come despite the current falling prices. This is especially true in the Asia Pacific where oil self-sufficiency is the lowest among all regions of the world. This thesis develops a deductive vulnerability-interaction theory to answer two major research questions: (1) What explains variations in the levels of strategic oil supply measures adopted by Asian net oil importing economies between 1994 and 2013; and (2) what explains the adoption of a high level of such measures by at least some of those economies during this period? This study hypothesises that the actual level of strategic oil measures decision-makers would adopt at any given time is the result of the interaction among the economy’s oil vulnerability (OV) and three key factors: (1) The level of decision-makers’ trust that oil markets can ensure reliable and affordable oil supply to the economy; (2) the economy’s overall implementation capability of strategic supply measures; and (3) the strength of private capital versus that of state capital in the economy. According to this reasoning, strategic oil supply measures would be higher if there is higher OV; or lower level of trust in oil markets; or higher overall implementation capability; or if private capital is stronger than state capital.

The vulnerability-interaction model develops here predicts the comparative levels of strategic oil supply measures adopted by two net oil importing economies at the same period or by the same economy in two distinct periods under two situations. It also specifies the results of the interaction of the explanatory variables in four cases. These include the two “extreme cases”: (1) a net oil importing economy with a low OV, high trust, low capability, and high-strength private capital would adopt a low level of strategic oil supply measures or none at all; (2) one with a high OV, low trust, high capability, and low-strength private capital would adopt a high level of such measures. Short of these “extremes,” the model further hypothesises two pathways for the adoption of a high level of strategic oil supply measures, the three-high type and the non-three-high type. This thesis conducts a preliminary assessment to test the vulnerability-interaction model with nine net oil importing economies in the Asia-Pacific, which establishes the model’s validity. This initial evaluation’s results also provide the basis for selecting two paired comparisons, India and Thailand and China and India, and one of the economies that adopted a high level of strategic oil supply measures, Taiwan, for more in-depth investigation. The study concludes that the vulnerability-interaction model compares well to the major alternative explanation of the adoption of interventionist oil supply measures – that of the Realist/geopolitical approach. Not having a high level of trust is found to be the most important \textit{a priori} condition that causes net oil importing economies to adopt a high level of strategic oil supply measures.
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In 2017 news headlines speculated about whether global oil prices would stabilise or slump further. Asian, and especially Chinese, national oil companies’ (NOCs) overseas oil investments do not generate as much media attention as was previously the case. This does not mean that net oil importing states in the Asia-Pacific and elsewhere suddenly stop intervening in how oil is supplied to their economies all together. It does mean that due to lower oil prices, the rhetoric linking oil supplies to national and international security calculations has temporarily abated. History and economics, however, suggest that the current situation only means oil is experiencing a declining phase in what is historically an oscillating price cycle. Prices will eventually rise again unless sufficiently disruptive technological innovations emerge and are widely disseminated to alter longer-term patterns. The zero-sum worldview that is often promoted by those who “securitise oil supply” issues would likely return with a vengeance when and if oil prices rise again.

1. **Discerning a Puzzle**

Even the dominant academic literature on state intervention in oil supply has clustered around periods of high oil prices: between the mid-1970s and early 1980s, and again between 2008 and 2013.\(^1\) The global “oil gut” that ended in the early 2000s prompted the establishment of an international oil pricing regime and the exchanges of this vital commodity that are more transparent and supply-and-demand driven than in previous eras. Over the past four decades, we have seen the exponential growth in the volume and sophistication in international oil trading.\(^2\) The oil sectors in many advanced industrialised nations have also by and large been liberalised and deregulated.\(^3\)

The Asia-Pacific has been consuming the biggest share of oil among all the regions in the world since around 2007.\(^4\) Yet the pace of oil sector liberalisation appears to

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2. The trading volume of the Intercontinental Exchange, one of the three major international exchanges of oil, for example, grew more than 65 times between 1995 and 2016 alone. Data for the calculation is from “Historical Monthly Volumes – ICE Futures Europe,” ICE Report Center. Accessed 2 March 2017, [https://www.theice.com/marketdata/reports/7](https://www.theice.com/marketdata/reports/7).
4. This is based on the data of various years of *The BP Statistical Review of World Energy*. If we adhere strictly to BP’s definition of regions, “Asia Pacific” first surpassed “North America” as the region that consumed the biggest share of oil in the world in 2006 (29.5% versus 28.9% respectively). If we exclude Australia and New Zealand from the calculation as part of “Asia Pacific,” the rest of the region surpassed the oil consumption share of North America around 2007. Both the Asia-Pacific-minus-Oceania region and North America consumed 28.7% of the world total that year.
be slower in the Asia-Pacific as a whole. However, there have been obvious variations in this region relative to how much the governments of individual net oil importing Asian economies have intervened in the oil supply to their respective economies. Besides, some economies appeared to adopt different levels of interventionist measures at different periods of time. This simultaneous existence of thriving international oil markets and continued but varying degrees of state intervention in the oil sectors present the puzzling phenomenon this thesis endeavours to understand and explain. As further discussed in the literature review section in Chapter Two, neither studies based on the neoliberal economic approach nor those on the Realist or geopolitical perspective satisfactorily explain these empirical observations.

The state or any government in fact is not so much an antithetical institution to the market as playing an instituting and maintenance role to it. In addition, the state can also make “affirmative use of market instrument,” meaning changing the more “market-displacing” status quo to one more closely adhering to those commonly understood as free market principles. Strictly speaking, therefore, state intervention in oil supply may be concordant with letting the open international oil markets supply and the domestic market system distribute the oil needed in the economy in an unfettered manner. That is why the term used in the research questions generated by the puzzle discussed here is “strategic oil supply measures” instead, which excludes any affirmative use of market instruments by the state or the government. Nonetheless, similar to many other studies on the politics of oil, this study often uses the term “state intervention” as a shorthand for market-displacing measures adopted by the state.

2. The Scope of this Study

The puzzling behaviour of the government of a net oil importing economies continuing to adopt varying levels of strategic oil supply measures simultaneously with fully-functioning oil markets, at least internationally, has not been confined to polities in the Asia-Pacific region. The Asia-Pacific, however, appears to have a high concentration of

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states that adopt various types and levels of such measures. China, India, and numerous other polities in the region, for example, have NOCs, even if these companies’ standing in their respective economies’ oil supply differs greatly. In addition, price control of some oil products was still common in the region as of 2013, the last year of the most recent price-rising cycle.7

More centrally, four of the world’s top five crude oil importers have been countries in this region in recent years: China, India, Japan, and South Korea.8 Since April 2015, China has overtaken the United States as the world’s top crude oil importing country.9 Nations that are not members of the Organisation of Economic Cooperation and Development (OECD) in Asia, most prominently China and India, will account for more than three-quarters of the net global increase in oil demand by 2030.10 Indonesia, the fourth most populous country in the world, will also be integral to this exponential increase.11 It switched from being the only member of the Organisation of Petroleum Export Countries (OPEC) in the Asia-Pacific to a net oil importer in 2004.12 The emergence of heavyweight Asian energy consumers and related issues such as climate change and energy poverty, have begun and will continue to create seismic shifts in the energy policy agenda and governance pattern in the world.13

Exactly how this shift will unfold and what the implications are remain unclear. Due to the increasing oil self-sufficiency in the United States caused by the “shale revolution,”14 and the either higher population or economic growth rates in major Asian

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countries, the centre of gravity of oil consumption politics is re-orienting from the United States and Europe toward Asia in the 21st century. This shift continues in spite of the falling oil prices in the last two to three years as oil producing countries have been even more eager to maintain their market shares in this region with still growing, if slowing, demands.\(^{15}\) The unusual month-long tour of the Saudi King in the Asia-Pacific in early 2017 is emblematic of this continuing shift.\(^{16}\)

The temporal scope of this study (1994 to 2013) is determined by two key factors. First, although spot trading in crude oil began in the early 1980s, it took almost a decade for it to become really widespread or in one commentator’s word, “truly viable.”\(^{17}\) Second, these two decades saw big swings in oil prices from the low of US$12.21 to the high of US$109.08 per barrel at the dollar value of 2013.\(^{18}\) This provides the opportunity to observe any impact oil prices may have on the levels of strategic oil supply measures adopted by net oil importing economies over time.

3. Research Questions

With the geographic and temporal scope of this study designated, the following two major research questions of this thesis can be identified:

(1) What explains variations in the levels of strategic oil supply measures adopted by Asian net oil importing economies between 1994 and 2013; and

(2) What explains the adoption of a high level of such measures by at least some of these economies during this period?

Quantitative researchers who engage in regression analysis may query the validity of designating a geographic scope that exhibits a concentration of the presence of the dependent variable (DV) of the research questions: adoption of strategic oil supply measures

\(^{15}\) Of the major net oil importing regions of the world, only the Asia-Pacific maintained slight increases in both crude oil and oil product imports as percentages of the global total from 2014 to 2015. The U.S. imported over 2% less crude and its product import remained the same over the same period; Europe’s crude import increased about 1% while its product import dropped very slightly. Data of the calculation is from \textit{BP Statistical Review of World Energy June 2016}, 19. BP website, accessed 1 December 2016, \url{https://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2016/bp-statistical-review-of-world-energy-2016-full-report.pdf}.


\(^{18}\) \textit{BP Statistical Review of World Energy June 2014}, 15. The prices quoted are for Dubai dated, the major reference crude for physical deliveries to Asia refineries.
by net oil importing states. I respond by clarifying that although this study endorses the view that a generalised theory to explain interventionist measures in the oil sectors adopted by the government of net oil importing economies will eventually materialise, a case-oriented approach is privileged here. In addition, the first research question already presumes that the DV encompasses a range of possibilities among the cases. Yet, it does not assign bias towards any particular level.

The deductive model put forward in this thesis to answer these research questions is based on set-theoretic methods and logic in social science, not on probability or regression analysis. For research that is predicated on such tools as set theoretic methods or process-tracing, selecting cases on the DV is not only acceptable, but is in fact expected.

4. Answering the Puzzle

The vulnerability-interaction model posits that net oil importing economies are motivated to adopt strategic oil supply measures because they have a noticeable level of oil vulnerability (OV). The actual level of these measures that any such economy adopts at any given time, however, is the result of the interaction of three intervening factors: (1) its decision-makers’ trust in the oil markets; (2) the overall implementation capability of the economy; and (3) the overall strength of private capital in the economy during the same period. The levels of all the variables of the model may change both across economies and over time.

This model further hypothesises that if all other things remain equal, the DV would be higher if: (1) there is higher OV; or (2) a lower level of trust that oil markets can provide adequate, reliable, and affordable supply of oil to the economy; or (3) a higher overall capability to implement the measures; or (4) private capital overall is stronger than state/government capital in the economy.

The vulnerability-interaction model specifies four pathways that would lead to the adoption of specific levels of strategic oil supply measures upon interaction of specific levels of the four explanatory variables at this stage:

(1) Low OV, high trust, low capability, and high-strength private capital would lead to the adoption of a low level of strategic oil supply measures (low DV);

(2) High OV, low trust, high capability, and low-strength private capital would lead to the adoption of a high level of such measures (high DV);

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19 This objection has been raised by a number of IPE and IR methodologists. See for example, Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry* (Princeton, NJ: Princeton University Press, 1994), 129-132.

20 For a discussion of the difference between these two very different approaches, see Gary Goertz and James Mahoney, *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences* (Princeton: Princeton University Press, 2012), Chapter 1 - Introduction, Kindle edition.

21 Ibid., Chapter 14 – Case Selection and Hypothesis Testing.
(3) High OV, medium trust, high capability, and high-strength private capital would lead to the adoption of a high level of such measures (high DV); and

(4) Noticeable OV, NOT high trust, high capability, and NOT high-strength private capital would also lead to the adoption of a high level of such measures (high DV).

5. The Study’s Roadmap

Chapter Two of this thesis details the reasoning and formulation processes underlying the vulnerability-interaction model, explains the niche it occupies among existing literature in the politics of oil consumption, and maps out the empirical strategy to test the model. Chapter Three presents a plausibility probe of the entire model because it has not been tested elsewhere. This preliminary study establishes the validity of various dimensions of the model and provides initial results for the selection of appropriate cases for more in-depth case-study investigation of the model in Chapters Four and Five. These preliminary results support the validity of the vulnerability-interaction model. It compares well overall to the major alternative explanation of the adoption of interventionist oil supply measures – that of the Realist/geopolitical approach. Chapter Four compares the cases of India and Thailand and China and India with 2013 data; Chapter Five examines Taiwan’s path to the adoption of a high level of strategic oil supply measures. Chapter Six concludes with a brief assessment of the vulnerability-interaction model’s overall validity and theoretical insights gleaned from the empirical data used to test and refine the model.

6. Contributions

This thesis makes both theoretical and empirical contributions to the study of the politics of oil consumption, and the two types of contributions reinforce each other. First, it puts forward a model to explain why Asian net oil importing polities as a whole continued to adopt strategic oil supply measures in two recent decades while simultaneously using the markets to supply oil to their economies to different degrees. It also hypothesises the combinations of factors that would result in the adoption of a high level of these measures, the most puzzling behaviour against the backdrop of thriving international trade of oil.

Second, state mandated, administered, or funded oil supply measures across the whole region have rarely been systematically examined, and so have not been adequately theorised. Existing theories that underpin studies on the international politics of oil tend to be structural or economic in nature. Decisions to adopt strategic oil supply measures by net importing states involve complex domestic and external economic and political considerations, and have not been well explained by sweeping grand theories. The vulnerability-interaction model provides an initial but more specific framework to
understand actual events and their implications. The typologies developed in this study can potentially expand the model’s applicability to a larger scope with further research.

Finally, the data gathered in the nine-economy plausibility probe add breadth to the knowledge in strategic oil supply measures adopted by net oil importing economies in the region, and in major factors that would lead to their adoption. Two important strategic oil supply measures are used to uniformly gauge the DV of all nine economies. This facilitates meaningful comparison and interpretation, and contributes to the systematic accumulation of empirical evidence of state actions related to oil supply. China has been the focus of attention of studies on state intervention in oil supply in the last decade. India, Japan, and South Korea have made “occasional appearances,” but not much has been known about the oil supply measures of other major Asian net importing polities and how they have evolved over time. A model that examines the facts as they were, not what they should have been, across the region is the first step in providing solid policy recommendations in subjects ranging from oil sector governance, climate change mitigation, poverty alleviation and economic development, as well as traditional security politics in the Asia-Pacific and beyond.
Chapter Two
Theorising State Intervention in Oil Supply

Some net oil importing states continue to play a relatively large role in the oil supply of their economies despite the increasing sophistication and trading volume in the international oil markets and the general global trend of oil market deregulation and liberalisation over the last three decades. Indeed, the level and nature of state intervention appear to vary both across economies and over time. This chapter develops a model to answer the two major research questions of this thesis, derived from the apparent puzzle posed by these trends: (1) What explains variations in the levels of strategic oil supply measures adopted by Asian net oil importing economies between 1994 and 2013; and (2) what explains the adoption of a high level of such measures by at least some of those economies during this period?

In the rest of the chapter, I will first explain the set-theoretic methods that underpin the deductive reasoning of the vulnerability-interaction model. I will then explicate the concepts and rationales behind strategic oil supply measures - the dependent variable (DV) of the proposed model, - and those of the explanatory variables. I then formally state the causal relationships among the variables and the hypotheses generated by the model. I also review the literature on oil importing states’ intervention in oil supply and pinpoint how this study relates to the existing literature. The chapter concludes by setting out an empirical strategy used to examine the validity of the hypotheses generated from the proposed model.

1. Necessary, Sufficient, and INUS Causes

The vulnerability-interaction model advanced in this study is formulated according to the qualitative logic behind set-theoretic methods, and with the help of typological techniques.\(^1\) As shown in subsequent chapters, however, many, but not all, the data used to substantiate the claims of the model and the tools used to analyse them is quantitative.

In set-theoretic methods of social sciences, a necessary cause or condition is one that must be present when an outcome is present.\(^2\) An example of this is not having the

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citizenship of a state is a necessary condition for being deported from it. A sufficient cause or condition is one that is enough to cause the outcome (Y), but is not necessarily present when Y is present. This is due to equifinality, meaning the existence of “many alternative causal paths to the same outcome.” An example of a sufficient cause for being sentenced to imprisonment is being convicted for robbing a bank. People serve time in prison for a myriad of other causes, and robbing a bank is one of them.

Few, if any, social phenomena can be fully explained by either a necessary or sufficient cause alone. Therefore, methodologists have derived at least two more types of set theoretic causes that are more often used in social science research. The one applied in this thesis is the INUS cause. ‘INUS’ is an acronym derived from a quote by J.L. Mackie that explains the term as “an insufficient but necessary part of a condition which is itself unnecessary but sufficient for the result.” James Mahoney gave the following example of an INUS cause:

A building can burn down (Y1) either because of a short circuit (A1) combined with wooden framing (B1) or because of a gasoline can (C1) combined with a furnace (D1).

In this example, Y1 can be caused by either A1 and B1 or C1 and D1. Each group is an INUS cause of Y1 as neither A1 nor B1 can sufficiently cause a building to burn down by itself, but both must be present (necessary) to do so. At the same time, either group is sufficient but not necessary to cause the outcome.

2. Strategic Oil Supply Measures

The level of strategic oil supply measures adopted is the DV of the vulnerability-interaction model proposed in this thesis. These measures are defined as those mandated, administered, or funded by the government that may have a direct effect on the oil supply to the economy. They may include state-to-state and state-to-other-entity military, political, diplomatic, as well as economic policies. Opaque arrangements made between the Chinese state or companies owned by or closely connected with the state and major oil producing or transiting nations or their national oil companies NOCs under the auspice of the “One Belt, One Road” initiative [一带一路] are examples of strategic oil supply measures.

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5 Ibid., 418.
6 Ibid.
The concept of strategic oil supply measures is inextricably linked with the role of the government in the economy, particularly within the oil sector of net oil importing economies. Therefore, understanding what those roles are is a pre-requisite to understanding what is counted as such a measure in this study.

After the end of the Cold War, almost all polities in the world have a mixed economy. A “mixed economy” is defined in this study as one that has “both a private and a public sector, linked through the operation of markets.”8 This means the state does play some role in the provision of goods and services in most economies.9 Four major roles of the state are conceptualised in this study, in ascending levels of direct involvement in a sector or industry concerned: facilitator, regulator, investor, and direct provider.10

Using the oil sector and oil supply as an example, all net oil importing states facilitate oil supply to their economies by setting up a legal framework and by enforcing signed contracts between parties. Many others also build transportation infrastructure for oil and oil products to be moved around the country. Tax incentives to stimulate investments in the oil sector are also considered manifesting the facilitative, not the regulatory, role of the state because these incentives ultimately rely on the willingness of private firms to achieve the goals. As regulators, some governments, such as South Korea, mandate the minimum amount of oil stock private or public oil firms operating in their economies must have. Others, such as China, stipulate which companies are authorised to import crude oil and oil products. Environmental laws that may cause an increase or decrease in oil production in importing economies that still have indigenous resources are not considered in this study. This is because these laws usually have only second-order and indirect effects on oil supply.

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9 The most common example, as Peddle suggests (ibid.) is primary and secondary education. This may be understood as “merit goods” which are provided by both the government and the private sectors in most economies. For discussions on the definition, rationales, and impact of public provision of merit goods, see Riccardo Fiorito and Tryphon Kollintzas, “Public goods, merit goods, and the relation between private and government consumption,” European Economic Review 48 (2004), 1367-1398; John G. Head, “On Merit Goods,” FinanzArchiv, New Series, Bd. 25, H. 1 (1966), 1-29; and see James M. Poterba, “Government Intervention in Markets for Education and Health Care: How and Why?” in Individual and Social Responsibility: Child Care, Education, Medical Care, and Long-Term Care in America, ed. Victor R. Fuchs (Chicago: University of Chicago Press, 1994), 285.
10 Peddle (ibid.) suggests three major functions of the government in a mixed economy: establishment and enforcement of a legal framework; adjust market outcome for collective notion of fairness; and mitigate market failures. John Zsyman suggests the three roles of the state in economic policymaking as regulator, administrator, and player. See Government, Markets, and Growth: Financial Systems and the Politics Industrial Change (Ithaca: Cornell University Press, 1983), 75-78. Ikenberry uses the facilitator, negotiator, and producer roles of the state to describe what he sees as increasingly interventionist energy adjustment strategies of the United States, Japan/Germany, and France respectively during the oil crises of the 1970s (The “Irony” of State Strength,” 112). The four roles in this study are adapted from all these works.
As investors, some governments fund, own shares, or oversee NOCs with a mandate to produce or acquire oil for their economies, including many in the Asia-Pacific. Some sovereign wealth funds, including those operating in China and Singapore, also invest in oil and other energy firms or projects. The mandate and mechanism to supply the oil produced from these funds to the home countries, however, is unclear in many cases and so their participation is not counted as a strategic supply measure in this study. As direct providers, government ministries, occasionally sign contracts with counterparts in oil exporting states to supply oil to their economies directly. Some governments also administer strategic petroleum reserves (SPRs) either directly through a government agency or through their NOCs. The vulnerability-interaction model only takes into consideration the regulator, investor, and direct provider roles, but not the facilitator role of the state in evaluating its degree of intervention in the oil sector. This last role only has an indirect and diffuse impact on the economy’s oil supply. Besides, even economies most observers would consider as adhering to free-market principles to a very high degree play the role of the facilitator.

The basic unit of analysis of this study is the state, personified by national level decision-makers in net oil importing economies. The national governments of net oil importing economies are seen as occupying a position in the international economic system that would generate similar preferences on how to realise the major goal of their oil policies: ensuring oil supply security, which is perceived to be vital to the wellbeing and survival of the economy. The different roles played by the state, however, also bring forth other actors that may also have a direct impact on national oil policies and the different levels of analysis of this study. Analysing a state’s regulator role involves examining state-to-firm interactions, and these interactions would only be domestic.

The investor role of the state also involves state to firm interaction. The state has a principal-agent relationship with publicly-owned and/or administered firms, which are competitors of private oil firms. When NOCs engage in oil projects, they may interact with domestic and overseas public entities, private firms, and foreign governments. Therefore, these interactions can be both domestic and international in nature. This is especially true if the NOC(s) pursue exploration and production or other oil related projects overseas. Moreover, when the state acts as a direct provider of oil, it would have both state- to-state and state-to-firm interactions. Last, but not least, all these actors have to interact with the diffuse, uncoordinated, yet powerful transnational forces of the international oil markets.

The relationship between the state and its NOC(s) is the subject of a number of studies in recent years due partly to the increasing prominence of some NOCs internationally. These studies mostly adopt a principal-agent framework to understand this relationship and highlight the simultaneous mutual support and tension between the two, as well as their sometimes divergent motivations. In short, the state and its NOCs are treated as separate
units of analysis. While acknowledging the valuable insights provided by these studies, this thesis treats oil supply-related actions by both the state and its NOCs as strategic oil supply measures. After all, the state is the principal actor and it ultimately decides to keep the agent (in this instance, NOCs) and the proportion of control over it, instead of letting the private sector freely handle the supply of this particular commodity. A key objective of this study is to investigate what causes this outcome as manifested by the actual level of these actions (strategic oil supply measures) taken by both principals and agents.

A related point about government roles in the provision of goods and services is that the state and the market are not necessarily diametrically opposing concepts. To begin with, the state is understood as the institutor and maintainer of any domestic market. Even “international markets” abide by the rules and regulations, if not norms, in countries where they are physically located. \textsuperscript{11} How “market-oriented” a particular strategic oil supply measure is has to be judged by the extent to which it permits, distorts, or promotes the functioning of a pricing mechanism based on demand and supply, and open and fair competition. Richard J. Samuels, for example, labels the two major categories of state intervention in the energy sectors as “market-displacing” and “market-conforming.”\textsuperscript{12} The former obviously is less “market-oriented” or more distorting than the latter. As further discussed in subsequent chapters, strategic oil supply measures creating varying degrees of market distortion are taken into consideration in this project.

To sum up, the proposed vulnerability-interaction model tries to explain variations of the levels of measures adopted by net oil importing states that have a direct impact on their economies’ oil supply, especially in the Asia Pacific, over the last two decades. It also hypothesises pathways that would lead to the adoption of a high level of such measures. It does not, however, try to evaluate the effectiveness of these measures in achieving oil supply security. That said, this study does make the assumption that a price mechanism that is based on supply and demand fundamentals and free and open markets for oil, both domestic and international, would on average achieve the best economic efficiency, especially over the long run.\textsuperscript{13} Otherwise, the puzzle of this thesis would not be puzzling any more.

\textsuperscript{11} This is at least the Polanyian understanding of the market. For a discussion of the Polanyian and the very different Schumpeterian understanding of what the market is and a synthesised understanding of the two, see Harvey and Metcalf, “The Ordering of Change: Polanyi, Schumpeter and the Nature of The Market Mechanism,” \textit{CRIC Discussion Paper 70}, March 2005.

\textsuperscript{12} \textit{The Business of the Japanese State}, 13.

\textsuperscript{13} Even if such a pricing mechanism may not exist perfectly in the real world yet. For a critique of the current “market-related” pricing regime in the international oil markets and how it appears to be still some way from this ideal, see Robert Mabro, “The International Oil Price Regime — Origins, Rationale and Assessment,” \textit{The Journal of Energy Literature}, Volume XI, No. 1 (June 2005): 3-20.
3. **Explanatory Variables**

The vulnerability-interaction model has two layers, each targeting one research question in this project. The first is designed to answer the first research question, which seeks to explain the variations in the levels of strategic oil supply measures adopted in different net oil importing economies and the same economy at different periods. The second layer tries to understand the major causes for some net oil importing economies to adopt a high level of these measures.

The model specifies four explanatory variables: 1) oil vulnerability (OV); 2) the level of decision-makers’ trust that oil markets can supply reliable and affordable oil to the economy; 3) the economy’s overall implementation capability of strategic supply measures; and 4) the overall strength of private capital versus that of state capital in the economy. These variables are initially chosen through observations of measures adopted by various net oil importing economies as well as through deductive reasoning.

OV is conceptualised as the variable that initiates the desire to adopt strategic supply measures and therefore is the independent variable (IV) of the model. The actual level of strategic oil supply measures adopted or not adopted - the DV of the model under consideration here - would be the result of the interaction among these four factors. No hierarchy of importance of the four explanatory variables is assigned in the first layer of the model as it tries to explain the adoption of different levels of the DV. As detailed in Section 4 below, the model specifies the results of the interaction of these variables in four cases by applying set theoretic methods and typologising techniques.

In the second layer of the model, not having a high level of trust in the oil market and having a high implementation capability are initially theorised as a priori conditions to adopting a high level of strategic oil supply measures. In this sense, these two explanatory variables at the level specified are privileged as being more important in causing the adoption of a high level of strategic oil supply measures than the other two variables. As detailed in the concluding chapter, after the testing of the model with empirical data presented in this thesis, trust in the oil market appears to have a greater impact than implementation capability on the adoption of strategic oil supply measures, especially at a high level.

The rest of this section explains these four explanatory variables in greater details one by one, justifies their selection over other possible contenders, and specifies their theorised relationships with the adoption of strategic oil measures. Factors affecting the level of strategic oil supply measures adopted by net oil importing economies other than the four advanced by the vulnerability-interaction model likely exist. The proposed model only argues that the hypothesised explanatory variables are among the most important sufficient
and necessary causes to the DV and they provide a systematic framework to understand this study’s designated research questions.14

3.1 Oil Vulnerability

The vulnerability-interaction model conceptualises OV as a sufficient but not necessary condition that motivates the desire to adopt or continuing to adopt strategic oil supply measures.15 This does not mean that OV by itself is a sufficient cause for the actual adoption of such measures. It is argued here that the desire to adopt these measures is conditioned by the three major factors listed in the previous sub-section. If all other factors remain equal, the proposed model hypothesized that the higher a net oil importing’s economy’s OV is, the greater its desire to adopt strategic oil supply measures would be.

What constitutes OV and what is the reasoning behind such a conceptualisation? In line with this study’s focus on measures adopted by the state to ensure oil supply security, OV is used in this model to mean ‘oil supply vulnerability.’16 Parallel to the two key components of oil supply security, physical availability and affordability, the components of OV formulated in this model are supply risks and market risks. “Supply risks” mean the likelihood that a country’s oil supply would not be physically available at any given time. “Market risks” mean the likelihood that the prices and the costs associated with oil imports become unaffordable to an economy.

Details of how OV is operationalised and measured will be provided in later chapters. It suffices to note here that since market risk is only one of the two components of OV, the fact that all economies in the same region pay more or less the same per barrel price for imported crude does not mean all have the same OV during the same period. For instance, different geographical locations, even within the same region, may cause noticeable differences in the risk of interruption of physical supply of oil over a relatively short period of time.17 Besides, the same price in absolute terms is not the same cost to all economies. There is a large body of literature that endeavours to measure OV, most encompass the concepts of the two types of risks adopted in this study even if the terminologies used may not be exactly the same.18

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14 For a discussion of the trivialness of sufficient and necessary causes, see Goertz and Mahoney, A Tale of Two Cultures. (“Assessing Importance: Coverage and Trivialness” Kindle version).
15 It is sufficient, but not necessary because some states, for example, may want to adopt strategic oil supply measures purely for political or other reasons.
16 This dissertation adopts the International Energy Agency’s (IEA) definition of energy security as “the uninterrupted availability of energy sources at an affordable price.” See IEA website, accessed 1 July 2014, http://www.iea.org/topics/energysecurity/. This is extended to define oil security to mean oil supply security - the uninterrupted supply of crude oil and oil products at an affordable price.
17 Oil from the Middle East, a major common source of supply to Asia, for example, does not need to go through the chokepoint of the Strait of Malacca to get to India.
A noticeable level of OV is theorised as a sufficient but not necessary condition that motivates net oil importing states to adopt strategic oil supply measures because of the continued importance of oil security to any economy. In spite of concerted efforts to develop diverse sources of energy after the oil crises of the 1970s, oil remains the most important primary energy source of the world, and the second most important one in the Asia Pacific, after coal. In 2013, it accounted for about 27.5% of the total primary energy consumed in the Asia Pacific, and is projected to remain the most used primary energy source in the world in 2035, even under the most optimistic scenario.

The transportation sector is heavily dependent on oil with no mass-scale substitute fuel for passenger cars or trucks in sight. This sector accounts for over half of global oil consumption. The expected high growth in the number of these vehicles with the rise of the middle class, particularly in China and other countries in Asia that are not members of the Organisation of Economic Cooperation and Development (OECD), is likely to further exacerbate the problem. This no doubt contributes to the low price and income demand elasticities on oil. The almost exclusive status of oil to enable rapid mobility has made it the lifeblood of military operations since World War I. Although the contemporary period is supposed to be the most peaceful in human history, states do not appear to have relaxed their military preparedness, including those in the Asia Pacific region.

While the impact of oil price volatility on an economy is less clear, the adverse effect would be more pronounced in poorer countries and those with higher oil intensities, both elements are formulated in the calculation of OV in this study. Therefore, the

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22 One study puts the long-term price and income demand elasticities on oil for OECD countries as -0.6 and 0.55 respectively, and those for non-OECD countries as -0.18 and 0.53 respectively. See Dermot Gately and Hillard G. Huntington, “The Asymmetric Effects of Changes in Price and Income on Energy and Oil Demand,” The Energy Journal 23-1 (2002), 52.
24 Five polities in the Asia-Pacific are among the top 10 recipients of arms transfer in the developing world between 1998 and 2005: India, China, Taiwan, South Korea, and Pakistan. See Bruce Vaughn, “U.S. Strategic and Defense Relationships in the Asia-Pacific Region” CRS Report for Congress January 22, 2007, 3.
25 One estimate suggests that a 10% increase in crude oil prices will cause the gross domestic product to lower by 0.2 to 0.5 % after six quarters. The economic impact of oil price volatility also seems to vary according to the speed of the price change and the background macroeconomic environment at the time of price change. See Hillard G. Huntington, “The Oil Security Problem,” Stanford University
uninterrupted supply of oil at an affordable price has substantial economic as well as military utility and hence national security significance. It follows that a reliable oil supply is also politically important to any state, regardless of its regime type.

The vulnerability-interaction model argues that an uninterrupted supply of affordable oil is perceived to be so critical to the normal functioning of net importing economies and the survival of the state that a noticeable level of OV is sufficient to generating the desire for adopting some level of strategic oil supply measures. The higher a net oil importing’s economy’s OV, the greater its desire to adopt strategic oil supply measures would be, *ceteris paribus*. The actual level of these measures adopted, however, would be conditioned by intervening variables (ITVs). Whether and at what level such measures are ultimately adopted depends on the result of the interaction among the economy’s OV and all the proposed conditioning factors, which are examined in the following sub-sections.

### 3.2 Trust in Oil Markets

The first ITV that boosts or restrains a state’s desire to adopt strategic oil supply measures is the decision-makers of the polity’s trust that oil markets can adequately provide oil security to the economy. The overall level of this trust is theorised here to be negatively correlated to the DV. This means the higher the level of overall trust, the lower the level of strategic oil supply measures would be adopted if all other factors remain the same. It is further theorised that the absence of a high level of trust in the oil markets is an *a priori* (necessary but not sufficient) condition for the adoption of a high level of strategic oil measures by a net oil importing economy.

There is no consensus on the definition of “trust” despite the increasing number of research on the topic in economics and international relations in the last two decades.\(^{26}\) This project defines trust in the oil markets as states’ belief that the private sector operating freely through the existing international markets and a domestic market with minimal government participation is the most efficient, reliable and affordable way to ensure supply to the economy.

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This definition is based on the behavioural definition of trust, which incorporates belief with actions. This belief is manifested by a lack of state intervention in those markets and procedures. On the intertwining nature of trust as a belief and as behaviour, Ernst Fehr says: “If trust is a behaviour involving trusting acts, then it is shaped by our beliefs about others’ trustworthiness as well as our willingness to accept the risks involved in trusting acts.” The vulnerability-interaction model posits that trust in the oil markets has both “objective” and “subjective” components. Another way of understanding trust is that it embodies both behavior and belief, and the two may not be easily teased out in practice. Although these two sets of concepts are only loosely related, both the behavior and belief and the objective and the subjective elements of trust appear to be mutually-reinforcing. The situational precondition of when trust is even called for is the existence of risk or uncertainty. Paraphrasing Chiles and McMackin, without vulnerability to risk, “there is no need to trust.”

Since the existence of risks is the precondition of trust, it is worth examining the concept of risk preference. Risk preference refers to whether a party is risk averse, risk neutral, or risk-seeking. In neoclassical economics literature, “a party which is risk averse will always prefer a certain profit to the prospect of fluctuating profits.” Adopting this view, it is proposed in this study that a state is risk averse if its default position on oil supply prefers certainty in availability and price to the prospect of fluctuating availability and prices through the open market systems. A risk neutral state is, conversely, indifferent to a prospect of short-term uncertain oil availability and price, if the expected average of the prospective fluctuating availability and prices through the open market systems match in the long run oil availability and price through methods that provides greater certainty. Finally, a risk-seeking state will always prefer fluctuating availability and prices if the expected average

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27 Fehr: 238.
28 Ibid.
29 In the case of investing in the stock market, for example, the objective component is “risk-return trade-off given the existing data” and the subjective element is the “faith (trust) that the data in our possession are reliable and that the overall system is fair.” Guiso et al call these “characteristics” instead of components. See “Trusting the Stock Market,” 2557.
30 Fehr, 236-238. Chiles and McMackin used the term “trust-like behaviour” to pinpoint the behavioural aspect of trust, 86.
31 On this point, Zand, as quoted in Chiles and McMackin, “described a spiral reinforcement process, in which one’s inner state of trust (mistrust) becomes transformed into behaviour that is trusting (mistrusting).” 87.
32 85. This precondition is also made clear in Guiso et al’s exposition of the objective and subjective characteristics of trust quoted in footnote 29.
33 Fehr highlights risk as a major component of the behavioural definition of trust, 236-37.
34 Chiles and McMackin: 81.
35 This is based on Aoki’s explication of risk neutrality which reads, “… a risk neutral party is ‘indifferent between a prospect of uncertain profits and a certain profit, provided that the expected average of prospective fluctuating profits is equal to the certain profit.” Ibid.
of these fluctuations via the open market system results in greater oil availability and lower prices than certainty in availability and price provided by other methods.\textsuperscript{36}

One subjective factor that is likely to affect decision-makers’ level of trust in the existing oil markets is their polity’s historical experiences with dominant market players, usually the hegemonic power(s) and their allies or close associates. Markets of different periods and products are organised with varying degrees of openness, transparency, and different price-setting mechanisms.\textsuperscript{37} Since hegemonic power(s) of successive periods are likely to be the creator, rule and agenda setter, and underwriter of major international economic systems, polities’ experiences in these markets would form the basis of decision-makers’ current trust in what Guiso \textit{et al} call “the fairness of the game.”\textsuperscript{38}

The history of the inextricable link between the hegemonic power(s) of the day and firms originated in those powers and the development of oil and the oil markets has been well chronicled by Daniel Yergin’s monograph \textit{The Prize}.\textsuperscript{39} The various price-finding and determination mechanisms throughout the century of oil’s preeminence appear to reflect more closely the power relationships between the major players of different periods than the fundamentals of demand and supply.\textsuperscript{40} Even if the “market-related” pricing regime adopted since the mid-1980s is more open and transparent than previous ones, I argue that experiences and impressions from bygone eras would continue to impact on policymakers’ decision-making. This is because the hegemonic powers and many of their international oil companies (IOCs) that were closely linked to the various past pricing regimes are still active in the international oil markets, even if to different degrees of dominance and in different permutations.

Another subjective component of trust in the oil markets is political entities’ cultural or ideological attitudes towards profit-making and the expected responsibilities of the government towards the underprivileged. I argue that these components would combine
to form unique frames of reference of decision-makers in different polities in interpreting even the same “objective” facts about the existing international oil markets and the allocative efficacy or justice of open markets in general.\footnote{This is similar to the concept of “determinants of risk preferences,” which include both “situational” and “constant” factors, such as problem framing, reference points (situational) and individual dispositions, national culture, and organizational cultural (constant). See Chiles and McMackin: 81.} In this sense, “trust” is still a form of rational calculations, but this rationality is bounded by the unique history, culture, and experiences of decision-makers of individual polities.\footnote{For a discussion of how variants of rationalist models applied in studies in international relations and their critics, see Miles Kahler, “Rationality in international relations,” International Organization 52-4 (Autumn 1998): 919-941. For how bounded rationality helps decision making in real life situations, see Gerd Giegerenzer and Daniel G. Goldstein, “Reasoning the Fast and Frugal Way: Models of Bounded Rationality,” Psychological Review 103-4 (1996): 650-669. For basic concepts of bounded rationality, see Herbert A. Simon, “Theories of Bounded Rationality,” in Models of Bounded Rationality, Volume 2 – Behavioral Economics and Business Organization (Cambridge: Mass: MIT Press, 1982), 408-423.}

The focus of this project does not highlight the deep historical and cultural factors that affect the risk preferences and beliefs of decision-makers due to the immense task of convincingly operationalising and comparing them across political entities. Instead, to indirectly gauge states’ levels of trust in the oil markets, the vulnerability-interaction model applies loosely Thierry Balzacq’s “pragmatic” or “sociological” approach to securitisation.\footnote{See “Constructivism and securitization studies,” in The Routledge Handbook of Security Studies, ed. Myriam Dunn Cavelty and Victor Mauer (New York: Routledge, 2010), 57. Balzacq also calls this the “strategic approach” to differentiate it from the “speech act view” of securitization of the Copenhagen School. See “The Three Faces of Securitization: Political Agency, Audience and Context,” European Journal of International Relations 11-2 (2005): 171-172, 192.} This approach sees successful securitisation as requiring more than just a “speech act” emphasised by the Copenhagen School. It also hinges on the status of the securitising agent and the external social contexts of the act.\footnote{Balzacq, “Constructivism and securitization studies,” 63. Also see “The Three Faces,” 173. For the Copenhagen School’s emphasis of the speech act in securitization, see Holger Stritzel, “Towards a Theory of Securitization: Copenhagen and Beyond,” European Journal of International Relations, 13-3 (Sep 2007): 360-361.}

In particular, the theoretical component to be applied here emphasises the presence and coherence of the securitising agent in the form of NOC(s) and the relevance of the context of the securitisation in the discourse on oil security.\footnote{The third factor Balzaq highlights is the audience. “The Three Faces,” 192.} According to Balzacq, the capacity of securitising agents lies in their use of appropriate “words and cogent frames of reference in a given context, in order to win the support of the target audience for political purpose.”\footnote{Ibid.} The vulnerability-interaction model focuses on an internal context and an external context, relating to decision-makers’ trust in the efficacy of the domestic and the international oil market respectively. It hypothesised that the geographic evenness and the degree of economic development of a polity form the internal context affecting decision-
makers’ trust in adopting an unfettered oil market domestically. Given the historical role of the United States in establishing the international oil markets and its continued preeminence in it, the proposed model hypothesised polity’s relationship with the United States as the most important external context to decision-makers’ trust in the international oil markets.

3.2.1 Securitising Agents

The blurred line between facts and their interpretations in risk assessment and belief formation puts NOCs in a unique position to be the prime securitising agent in the discourse of oil security. Balzacq highlights the “power positions,” “social identity,” and the “capacity of the target audience, and…alternative voices within the relevant social field” as aspects impacting on agents’ persuasiveness.47 Once created, NOCs are likely to justify their continued existence, if not further expansion. In addition, they usually have a high concentration of technical and organisational expertise in oil supply issues, which endows their “security utterances” with apparent authority to both decision-makers and the public alike.48 Of course, NOC executives are not only people who may be motivated to securitise oil supply, as the “Unocal affair” in the United States has dramatically illustrated.49

NOCs certainly have the motive as well as the status to do so. This does not mean that NOCs themselves have not been active participants and indeed beneficiaries of the existing international markets at some point since their establishment in the 1980s. Most NOCs of net oil importing economies without a liberalised domestic oil market likely have profited from the differences in prices between the international oil markets and their respective domestic market.50 Another way they may have benefited is the de facto monopoly many of them enjoy in the domestic market. In general, the more controlled the domestic market is, the more NOCs would lose from it being liberalised, and hence the more reason for them to strategically securitise aspects of the international or domestic oil market.51 The particular aspects chosen for securitisation are likely the most pertinent to the contexts for their home countries and the most pivotal to their profitability or survivability or both.

47 “Constructivism and securitization studies,” 64.
48 Ibid., 173. These are the audience of securitization, the third factor that may impact the effect of securitization in Balzacq’s earlier formulation (2005). In his later formulation (2010), he discusses more about the type of “heuristic artefacts” used as the third decisive factors. See Constructivism, 64.
49 For a detailed examination of how China’s National Offshore Oil Corporation’s bid for Unocal Oil Company of California was securitised by American political elites such as representatives to the U.S. Congress with a securitisation approach, see Joanna Nyman, ”’Red Storm Ahead’: Securitization of Energy in US-China Relations,” Millennium: Journal of International Studies 43-1 (2014): 43-64.
50 This is especially true for countries still have substantial indigenous oil resources and when the international prices are much higher than domestic prices.
51 This is no different from a private firm which has been operating in a monopolised and highly regulated market.
I argue here that even if the risk assessment and “facts” of the polity’s oil supply situations NOCs promote do not always amount to actual securitisation as understood in securitisation theories, these assessments and representations would at least be equivalent to powerful lobbying or politicisation. As such, they would still skew decision-makers’ trust level in oil markets. That is why I mention earlier this analysis only loosely adopts the pragmatic approach of securitisation. Following this line of reasoning, the presence of cohesive NOC(s) is theorised to be negatively correlated with the level of trust in the oil markets.

3.2.2 Internal Context of Securitisation

I argue that the evenness and degree of economic development of a political entity provides an important internal context NOCs may readily exploit in their securitising/lobbying effort. These two aspects can combine to affect decision-makers’ calculation of the risk of only relying on private firms and the market mechanism to supply oil to most customers at an affordable price in the domestic market. In a continental size country with a large rural and poor population, private oil firms would likely concentrate on supplying oil to the more profitable urban areas, thus leaving the majority of people underserved. This would have a negligible impact on economies that are more evenly developed and/or whose population mostly has reached a high standard of living and hence oil products only take up a relatively smaller percentage of their income.

These supply security issues, of course, may be alleviated to a certain extent by measures such as oil or other energy credits for low-income residents, not to mention the development of renewable or other forms of energy sources. They can, however, also easily be framed by NOCs as an existential threat to a regime, especially one that rules over a polity with a strong expectation of the government as a provider of basic necessities. Intuitively, not attending to the basic needs of a large vulnerable population is conducive to electoral setbacks in democracies and unrest in non-democracies. NOCs can then justify their existence as providers of the required oil supply to this population. Framed in this way, decision-makers’ risk preference can easily be pushed from neutral to adverse. Ultimately, all regimes try to survive as long as possible and trust is difficult to come by when the stake is or is believed to be as high as survival. Domestic oil supply security would be especially applicable to the geographic scope of this study as many economies in the Asia Pacific are

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52 An issue would need to be labelled as an “existential threat” that calls for extraordinary measures (“above politics”) to reach the level of securitisation according to securitization theories. The lower level of the securitisation process is called politicisation. See Barry Buzan and Lene Hansen, The Evolution of International Security Studies (New York: Cambridge University Press, 2009), 214.
still relatively poor, underdeveloped, and tend to have more paternalistic cultures than those in the West.

3.2.3 External Context of Securitisation

Polities’ relationships with the United States during the period studied is hypothesised in this study to be the context that NOCs and other interested parties may exploit to lower decision-makers’ trust in the international oil markets. First, oil is very unevenly distributed geographically and the bulk of it delivered to Asia-Pacific polities relies on a few shipping “chokepoints.” Although most Asia-Pacific oil importing economies are heavily dependent on oil that has to be shipped through at least some of these same maritime chokepoints, they are not subjected to the same degree of potential threat of having their oil supply physically cut off. The United States possesses concentrated naval power to control the physical flow of oil along key regional maritime shipping routes. Llewelyn Hughes and Austin Long conclude this may be “the most important long-term security problem in the international oil market,” especially for non-U.S. ally oil importing countries in the Asia Pacific, such as China. The international oil markets would fail to provide oil supply security if maritime oil transportation security cannot be assured, especially for the Asia-Pacific.

Second, U.S. oil firms and those originated in countries that are close U.S. allies are still among the biggest and most profitable in the world even if NOCs control most of the world’s oil reserves and production. The United States is also the leader in advanced

55 Ibid., 188. Of course, if hydrocarbons of marketable quality and prices can be produced in the South China Sea, a new dynamic may develop. This development, however, appears to be rather distant in the future and its effect cannot be accurately estimated at this juncture.
56 Two of the world’s top 10 publicly traded oil companies on the 2013 Forbes Global 2000 list are U.S. oil corporations and four of them originated in close U.S. allies. They are (in descending order of their rank on the list): Exxon Mobil (5), Shell (7), Chevron (13), BP (18), Total (23), and ENI (30). The remaining three are NOC spinoffs or NOCs: China Petrochemical Corporation (4), China National Petroleum Corporations (5), and Petrobras (25). This skips over OAO Gazprom (21) since it only engages in the natural gas, not oil, sector. Accessed 10 September 2016, http://www.economywatch.com/companies/forbes-list. According to the World Bank’s estimate as of 2010, NOCs controlled 90% of the world’s oil reserve and 75% of the production. See Silvana Tordo et al, National Oil Companies and Value Creation, Volume I (Washington, D.C.: The World Bank, 2011), xi.
oil production technologies and equipment, such as hydraulic fracturing and horizontal drilling, which may prove a game changer in global oil productivity.57

Objectively, these facts should not have a direct bearing on decision-makers’ trust in the existing international oil markets. I argue, however, they can provide the needed external context for persuasive NOCs and other interested parties of net oil importing countries to sow doubts in the wisdom of solely relying on these markets or the fairness of the system.58 This external context is especially pertinent in a region that appears to be still traumatised by colonialism, mostly inflicted by the dominant market players as recently as the first half of the last century.59 One way to exploit this external context for securitisation is to promote a zero-sum view of the international political economy and to project the same intentions onto other nations, especially the United States, the dominant power of the existing international political and economic systems.

If decision-makers take it for granted that leaders of the United States also adopt this zero-sum worldview, the risk of over-reliance on the international oil markets for supply during any confrontational situations with it can credibly be securitised. The United States and companies originated there can be portrayed as trying to perpetuate their historical dominance by whatever means possible, especially toward political entities not having a friendly relationship with them. NOCs in these political entities can indirectly justify their existence, both to make alternative arrangements in preparation for any future confrontations and to participate in the international markets to reap the benefits for the nation while the “good time” lasts. In short, this is an aggressive zero-sum form of economic nationalism.60

57 This has rapidly increased the global share of the United States’ oil production from 8.98% in 2010 to 13.86% in 2015. The calculation is made from data on BP Statistical Review of World Energy June 2016, 8. The lifting of export ban on oil and gas by the U.S. government in December 2015 allows resources extracted with that technology in the United States be directly supplied to external buyers. BP also predicts that the United States will be “energy self-sufficient by 2021” and “oil self-sufficient by 2030.” See Bob Bryan, “BP: The US will be energy independent in 5 years,” Insider Australia, 25 March 2016. Accessed 12 December 2016, http://www.businessinsider.com.au/bp-us-energy-self-sufficient-in-5-years-2016-3?r=US&IR=T.

58 An official Indian think-tank report, for example, makes the argument that America’s energy independence resulting from its advanced hydrocarbon E&P technologies has different implications for China, India, and the world at large. See Shebonti Ray Dadwal, The Geopolitics of America’s Energy Independence: Implications for China, India and the Global Energy Market (Delhi, Institute for Defense Studies & Analyses, 2013). In addition, Defense establishments are possible “interested parties” since playing up the likeliness of the United States using its superior naval capability to block maritime oil transportation would be one way to justify and increase their budget shares.

59 For the lingering impact on the perception and foreign policies of two major powers in Asia, see Manjari Chatterjee Miller, Wronged by Empire: post-imperial ideology and foreign policy in India and China. Stanford, California, 2013.

60 Some studies use the term “mercantilist” or “neomercantilist” to describe some countries’ energy acquisition behaviour, which mostly mean a state-led versus market-led strategy with a zero-sum mentality. Economic nationalism is more appropriate to describe the situation wherein nations employ a diverse array of economic policies to achieve the underlying goal of “bolstering power, prestige, or the prosperity of the nation.” Economic nationalism is not necessarily zero-sum in
The coherence of oil supply securitising agents and the relevance of the internal and external contexts of securitisation in individual net oil importing economies are theorised to be the most pertinent in contributing to decision-makers’ overall trust level in the oil markets. The coherence of securitising agents is theorised here to be positively correlated to the level of trust in the oil markets, while the relevance of securitising contexts, both internal and external, is negatively correlated.

3.3 Implementation Capability

The second intervening variable (ITV) that conditions the actual level of strategic oil supply measures adopted is a polity’s capabilities to implement such measures. The vulnerability-interaction model theorises this explanatory factor to be positively correlated to the actual level of strategic oil measures adopted by a net oil importing economy. This means that the higher the economy’s implementation capability, the higher the level of these measures would be adopted if all other explanatory factors remain the same.

Implementation capability refers to material capabilities and capabilities that can directly facilitate the adoption of strategic oil supply measures. These include an economy’s financial, technical, diplomatic, and bureaucratic capabilities. Many of these measures, such as establishing or administering NOCs or strategic petroleum reserves (SPR), are capital-intensive, and require technical as well as organisational skills. Some others, such as backing a pariah oil producing state at the United Nations, call for considerable political or diplomatic capital.

An equally important factor that would affect states’ capability to mobilise and use these resources is the degree of centralisation of state authority. Samuels has studied the effect of both the horizontal and vertical concentration of state authority on the extent of state intervention in various energy sectors in Japan. The vulnerability-interaction model accepts Samuels’ proposition that a highly centralised state would intervene in what he calls a more “market-displacing” manner if all other factors remain equal. For the sake of simplicity, however, this study mostly focuses on how consolidated the capabilities and authority of national governments are (horizontal concentration). The balance of power orientation, but it is much easier to securitise oil supply to promote and project both economic nationalism and a zero-sum understanding of the international political economy. For a discussion of the historical origin and contemporary understanding, including the definition quoted earlier, of economic nationalism, see Eric Helleiner, “Economic Nationalism as a Challenge to Economic Liberalism? Lessons from the 19th Century,” International Studies Quarterly, 46-3 (September 2002): 307-329 (definition on page 310). For examples of studies using “mercantilism” or “neomercantilism” to describe countries’ energy acquisition strategies, see Jeffrey Wilson “Northeast Asian Resource Security Strategies and International Resource Politics in Asia,” Asian Studies Review 38:1 (2014): 15-35 and Charles E. Ziegler and Rajan Menon, “Neomercantilism and Great-Power Energy Competition in Central Asia and the Caspian,” Strategic Studies Quarterly (Summer 2014): 17-41.
between the national and the local or regional governments (vertical concentration) should be less important as oil supply measures in most net oil importing economies are to a great extent externally-oriented. Foreign economic policymaking, especially in the oil sector, is mostly the domain of the national government.

There are subtle but important differences between implementation capability and the concept of the strength of state capital, which is an important component of the last ITV of the proposed model. As further explained in the next sub-section, the strength of state capital includes material capability. More critically, however, it refers to the institution-endowed authority to implement economic policies at will in the domestic domain unencumbered by private capital interests. Some examples of institutions that are pivotal to the strength of state capital are property rights laws, environmental regulations, and the judicial system in general. Logically the degree of centralisation of state authority would have an impact on both implementation capability and strength of state capital. Centralisation of authority is only factored in this second ITV for parsimony. The third ITV would only concentrate on issues related to the overall economic freedom and openness, not the concentration or the exercise of political power, in the polity. Finally, the emphasis of the next IVT is the strength of the private capital in relation to that of the state, especially in the various petroleum sectors.

In short, a net oil importing economy’s capability to implement strategic oil supply measures has a very tight focus. Only the “resource supplier” role of the state is investigated.61 The capability to implement these measures is deduced here to be so important that having a high capability is theorised as the other a priori condition for the adoption of a high level of DV. This is because capability is the requisite material conditions to realise any desire to adopt strategic oil supply measures and it is relatively immutable over the short to medium term.

Adopting strategic oil supply measures is to some extent a “non-financial” hedge against market failure and physical supply risks. Hedging may provide security, but it does incur costs. Only those who are capable can bear the costs, thus the necessity of having a high capability to actually adopt a high level of these measures. The vulnerability-interaction model, however, does not suggest all economies that are capable would engage in this type of hedging, especially not to a degree proportionate to their capabilities.62 An economy with

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62 Again, this is concordant with the notion of asymmetry in set theoretic methods: “insights on the causal role of a condition are of only limited use for the causal role of its absence.” See Schneider and Wagemann, 3.3.3.
a high capability as well as a high level of trust in the oil markets, for example, may not adopt a high level of strategic oil measures according to the logic of the proposed model.

3.4 Strength of Private Capital

The last ITV that interacts with OV to determine the actual level of strategic oil measures adopted is the overall strength of private capital versus that of the state. The vulnerability-interaction model theorises that this factor negatively correlates with the DV. This means that the greater the overall strength of private capital is in a net oil importing economy, the lower the level of strategic oil supply measures would be adopted if all other factors remain the same.

The model proposed here posits that the relative strength of private capital in an economy has two major sources: historical-institutional and actor-specific. The strength of private capital in any particular industry is conditioned by both the long-term institutional configurations of the economy, as well as the more immediate actor-specific configurations of that industry.

A polity’s level of overall economic freedom summarises its institutional and historical limits on the strength of private capital versus that of the central government. The proposed model posits that the freer and more open a polity’s overall economy is at any given time, the more resistance to the adoption of strategic oil supply measures would be. This would in turn result in fewer such measures actually being adopted or a lower DV, if all other factors remain equal.

The actor-specific source’s impact on the private-state-capital-strength balance focuses on the power of both domestic and international private capitals have versus that of the state in the form of state-owned enterprises (SOEs) in different sectors of the oil supply chain. This balance simultaneously contributes to and is impacted by the overall strength of private capital in the economy. This is an expansion of the concept of “state capacity” or “state structure” in independent economic and other policymaking expounded in earlier studies in two ways. First, it explicitly factors in the relative strength of private capital and state capital in the form of SOEs, particularly NOCs, in the economy. Second, it disaggregates private capital into international capital and domestic capital because the two may not have the same preferences on domestic market governance at all times.

Historically, U.S. and European firms were the only international oil companies and indeed other types of multinational firms. SOEs have not been very prominent in Western Europe and almost non-existent in the United States in the last couple of decades.

The dramatic “rise” of non-Western economies and the partial liberalisation of global capital movement during the period covered by this study justify a more detailed understanding of these dynamics on the adoption of strategic oil supply measures. This is because SOEs in general are still commonly found in many net oil importing economies in the Asia-Pacific and domestic capital in this region can hardly be equated with international capital as in the case of the United States, and to a lesser degree Western Europe, in the last century.⁶⁴

Private investments in most economies during the period examined in this project came from both international and domestic capitals in a number of sectors, often including those responsible for directly supplying oil to the economy.⁶⁵ The preference of international capital is hypothesised to be freedom of actions from state intervention or competition.⁶⁶ Its strength in an economy, therefore, is theorised here to have a negative correlation with the level of strategic oil supply measures adopted by the state. The relationship between domestic private capital and the state is more complicated. There are four possible scenarios regarding the strength of domestic private capital vis-à-vis those of international capital as well as SOEs at any particular point in time.

First, if domestic private capital is stronger than or at parity with both international capital and NOCs in absolute terms, it would have a similar preference regarding state intervention and the same correlation with the DV as those of international capital as specified earlier. This is because not only would domestic oil firms feel confident in competing with multinational companies or SOEs, they would also prefer a liberal trade regime at home so they can more convincingly push for the opening of overseas markets.⁶⁷

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⁶⁴ Nanà de Graaff goes so far as to explain the current “global energy order” as a result of the “hybridization” of two underlying driving dynamics: the relentless “widening and deepening” of the “transnational dimension” of the more liquid global capital and the “continuation and rearticulation of state power” in the current era. Her study inspires the overall private capital-state strength conceptualization in this section. See “The Hybridization of the State-Capital Nexus in the Global Energy Order,” Globalizations 9:4 (2012): 531-545.

⁶⁵ Private capital refers to relatively bigger businesses in this project versus small businesses and household production. The reason for this is twofold. First, almost all international capital (inflow foreign direct investments) comes in the form of larger businesses or institutional financial portfolio investors in most sectors, including and especially in the oil supply sector. Second, the small size and diffuse nature of small business owners and household producers often render them not very coherent or consistent. They also are in competition with larger businesses for capital and labour and in general almost never engage in the oil supply sectors.

⁶⁶ Illegal and other dubious acts to gain special access, such as bribery and corruption, are excluded in the consideration here, even if multinational corporations are far from immune to such acts. For a discussion of multinational firms engaging in corrupt practices, see Joel S. Hellman et al, “Far from Home: Do Foreign Investors Import Higher Standards of Governance in Transition Economies?” The World Bank 2002, accessed 1 September 2016, http://siteresources.worldbank.org/INTWBIGOVANTCOR/Resources/farfromhome.pdf. Again, state/polity intervention is used here in the sense that excludes the affirmative use of market instruments by the state.

⁶⁷ This is a simplified and partial application of the logic Hughes uses to explain the different degrees of openness of oil market governance in France, Japan, and the United States. See Hughes, Globalizing Oil.
Second, if domestic private capital is weaker than international capital in either absolute terms or only in the domestic market, but stronger than or at parity with NOCs, it would try to “capture” or “influence” the state to implement preferential policies in its favour. These policies would include but not limited to setting up entry barriers to international firms and capital to the domestic market so domestic corporations can buy time to grow stronger to compete with international capital. In this scenario, it is possible that the actor-specific source may have a positive correlation with the DV. This suggests that a greater domestic capital strength versus that of the state (but weaker than that of international capital) may result in a higher level of strategic oil supply measures adopted. Whether this positive correlation would realise and the extent of it depend on the degree of success of the capturing effort. The situation will only change when and if domestic capital grows to the point of having equal or greater strength than international capital and NOCs in absolute terms. At that point, the correlation with the DV would revert to the same as the first scenario, resulting in a negative correlation.

The third scenario is domestic private capital being weaker than both international capital and NOCs. In this case, the correlation of this source of the ITV with the DV would depend on the orientation of the state. The orientation of the state in the oil supply sectors is hypothesised as being predicated on the economy’s OV and decision-makers’ trust in the oil markets. As these are already factored in two other explanatory variables of the vulnerability-interaction model, their effects will be counted as neutral in this ITV. Unless international capital is totally absent in an economy, in this scenario, the correlation of this source of the ITV with the DV would also be negative. This is because with the effect between domestic private capital and NOCs neutralised, the always negative correlation of international capital with the state becomes the overall private capital-state strength balance. In general, the greater the presence of international capital already has in the domestic

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68 I use the terms “capture” and “influence” in a broad sense which would include a wide range of tactics such as lobbying, electioneering, securitising, or appealing to the nationalistic sentiments of existing governing elites and/or the public. The term “capture” is used in a narrow sense to mean corruption in the state capture literature. For an example of equating state capture with corrupt practices, see Joel S. Hellman et al, “Seize the state, seize the day: state capture and influence in transition economies,” Journal of Comparative Economics 31(2003), 751-773. Of course, this “capture” would only be necessary if the state does not already have a pro-domestic businesses orientation or agenda already.

69 Hypothetically, there is another way the situation may change, but it is has yet to be observed in reality: the state grows stronger and its orientation changes from championing domestic capital to being totally even-handed towards both domestic and international capital or even favouring international capital.

70 The orientation of the state towards its adherence to free market principles for the economy as a whole is a complex interaction of factors such as the ideological legacy of the ruling elites and the experience the economy has with the free market as a mode of organisation of exchange both internally and externally.
market of an economy, versus those of the domestic private capital and NOCs, the more pronounced the negative correlation would be.

The fourth scenario - domestic private capital being stronger than international capital but weaker than NOCs in absolute terms - is logically possible but empirically improbable. This is especially true in the region and timeframe that are reviewed in this thesis. If the situation does emerge, domestic private capital again would behave in a way that is negatively correlated with the DV. The contest for control or freedom of action essentially would be simplified from a three-way to a two-way dynamic. The situation is similar to that of scenario 1 above. Figure 2.1 below summarises the hypothesised relationships between domestic private capital and the DV:

<table>
<thead>
<tr>
<th>NOCs</th>
<th>International Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stronger</td>
<td>Weak</td>
</tr>
<tr>
<td>Negative</td>
<td>May be positive due</td>
</tr>
<tr>
<td>Scenario 1</td>
<td>to state “capture”</td>
</tr>
<tr>
<td></td>
<td>Scenario 2</td>
</tr>
<tr>
<td>Weak</td>
<td>Negative due to</td>
</tr>
<tr>
<td></td>
<td>effect of int capital</td>
</tr>
<tr>
<td></td>
<td>counts as neutral</td>
</tr>
<tr>
<td>Scenario 4</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.1 Actor-specific component correlation with DV, depicted as domestic private capital’s relationship vis-à-vis strength of international capital and NOCs

The analysis above shows that in at least three out of the four scenarios, the actor-specific source of the overall private capital strength would have a negative correlation with the DV. The historical-institutional source of this ITV, as manifested in the degree of overall economic freedom and openness, is theorised to always have a negative correlation. Therefore, the cursory understanding of this explanatory factor is that the stronger private capital is in an economy, the lower the level of strategic oil supply measures would be adopted. Figure 2.2 below summarises the overall correlation of this explanatory variable with the DV of the proposed model and the component parts of the variable:
Having examined all the explanatory variables, I will next delineate the causal relationships among these variables and formally state the hypotheses generated from the reasoning of the vulnerability-interaction model.

4. Beyond Vulnerability

The vulnerability-interaction model argues that a noticeable level of OV is a sufficient but not necessary condition that motivates decision-makers of net oil importing economies to adopt some level of strategic oil supply measures. Having the motivation to adopt such measures does not necessarily translate into the actual adoption of them. It is argued here that the desire to adopt these measures is conditioned by three major factors: decision-makers’ level of trust that oil markets can adequately provide oil security; the capability of the state to implement such measures; and the relative strength of private capital versus that of the state in an economy. The actual level of strategic oil supply measures adopted - the DV of the model under consideration here - would be the result of the interaction among these four factors: OV as the independent variable and the three conditioning factors as ITVs. Specifically, the vulnerability-interaction model posits that all other factors being equal, the DV would be higher if: (1) there is higher OV; or (2) a lower level of trust that oil markets can adequately provide oil security; or (3) a higher overall

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71 A “noticeable level” is defined here as having an OV score of 10 and above out of a maximum of 100. Economies known to be on the verge of turning into net oil importers, such as Malaysia, have an OV score around 10 using the computation methods adopted in the preliminary study in this project and data from the BP Statistical Review of World Energy 2014.
capability to implement the measures; or (4) Private capital overall is stronger than state
capital in the economy.

At this stage of its development, the vulnerability-interaction model can only
specify the result of the interaction of these explanatory variables in four cases. The two
hypothetical “extreme cases” according to the reasoning above are: (1) a net oil importing
economy with a low OV, high trust, low capability, and high-strength private capital would
adopt a low level of interventionist or strategic oil supply measures or none at all; and (2)
one with a high OV, low trust, high capability, and low-strength private capital would adopt
a high level of such measures. Each of the four explanatory variables at the stipulated level
in each case is by itself a necessary but not sufficient condition to the designated level of
strategic oil measures adopted. To put it slightly differently, each of these extreme cases or
groupings of explanatory variables as a whole forms an unnecessary but sufficient pathway
or an INUS cause to the adoption of respectively a low and a high level of strategic oil
supply measures. The other two pathways are discussed in Section 4.2. Figure 2.3 below
provides a graphical representation of these four cases: one pathway leading to the adoption
of a low level of DV and the three pathways to a high DV that are proposed:

![Figure 2.3 Causal Pathways to Adoption of Strategic Oil Supply Measures](image)

The vulnerability-interaction model applies the logic stated earlier to seek
answers to the two research questions of this thesis and hence has two distinct layers. The

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72 To facilitate deduction and render hypothesising manageable, all explanatory factors as well as
the DV, originally conceptualised as continuous, are converted into trichotomous ordinal variables
in the discussions of both layers of the model.
first layer tries to explain variations in the level of strategic oil supply measures adopted by net oil importing economies. The second layer tries to understand what causes the adoption of a high level of such measures by some of these economies. The next two sub-sections present two hypotheses for each of these two layers to be tested in the empirical chapters.

4.1 Explaining Variations

The first layer of the vulnerability-interaction model explains variations in DV levels among or within cases with two hypotheses:

**H1:** If the levels of all four explanatory factors (IV & ITVs) are similar in two cases, the value of their DV should be similar; and

**H2:** If the levels of three factors are similar in two cases, their DV levels should be congruent with the result caused by the difference in their fourth factor as predicted by the model.

If the only substantive difference in the levels of the four factors between two cases is their OV, for example, the case with the higher OV should have a higher DV. If the only substantive difference is the economies’ trust in the oil markets, the one with an overall higher trust should have a lower DV.

The relational nature of the logic enables the testing of hypotheses without setting fixed thresholds of the levels of the variables *a priori* arbitrarily. This means that whether an economy is designated as having adopted a high, medium, or low level of strategic measures at a certain period during the empirical test of this layer of the model depends on the cohort of economies being tested. This has the benefit of not having first to determine and justify the category thresholds and presumably is less bias-prone.

This layer of the model also has a cross-temporal dimension, meaning H1 and H2 are supposed to be applicable to comparisons between meaningfully different periods within the same economy in addition to among different economies. What constitutes meaningfully different periods is debatable. As further explained in the empirical strategy in the last section in this chapter, it is argued that the two-decade period of this study can be meaningfully divided into two equal-length periods to test this cross-temporal dimension of the model, one representing a decade of low and the other high oil prices in the international markets respectively.

4.2 Explaining High Level of Intervention

The second layer of the model investigates the most puzzling cases of a high level of state intervention in oil supply against the background of thriving international oil trade and increasingly liberalising domestic oil sector governance. Apart from the “extreme” case stated earlier, the vulnerability-interaction model proposes two causal pathways or combinations of specific levels of the four explanatory factors that would result in the
adoption of a high level of strategic oil measures. These two hypotheses are generated with the help of typologising techniques. Each of the hypotheses below corresponds to the pathway of the same number in figure 2.3 earlier.

**H3:** A net oil importing economy that has adopted a high level of strategic oil supply measures would have a high capability, high OV, high-strength private capital, and a medium level of trust in oil markets (three-high case).

**H4:** A net oil importing economy that has adopted a high level of strategic oil supply measures would have a high capability, a noticeable OV, and must NOT have high trust in oil markets, nor high-strength private capital (non-three-high case).

### 4.2.1 Typologising Adoption of High Level of Strategic Oil Supply Measures

Typologising is used to help the generation of hypotheses pertaining to pathways leading to the adoption of a high level of strategic oil supply measures, which resulted in H3 and H4 stated above. While the validity of H3 and H4 will be examined with cases in this thesis, their applicability is also open to the possibility of being generalised to other net oil importing economies. Typologising is an appropriate tool to achieve both goals as typological theories are designed to identify “both actual and potential conjunctions of variables, or sequences of events and linkages between causes and effects that may recur” [emphases added].

The vulnerability-interaction model posits two a priori necessary but not sufficient conditions for a net oil importing economy to adopt a high level of strategic oil supply measures: (1) a high capability to implement strategic oil measures by the state or polity under review; and (2) decision-makers of the state or polity not having a high level of trust in oil markets. Therefore, there are only three variables that need to be taken into consideration: OV, strength of private capital versus that of the state, and trust in oil markets. Figure 2.4 below shows all 18 mathematically possible configurations or pathways leading to a high level of DV with the capability being fixed at a high level:

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73 Pathways to low DV in absolute terms cannot be meaningfully generated at this time because I cannot specify at least one a priori necessary condition (a specific level of one of the four factors) for a low DV. Therefore, there are too many mathematically possible pathways even in trichotomous (3⁴=81) configurations to make testing them practical. For an explanation of how this number comes about and the process of how to construct an explanatory typology in general, versus more descriptive typologies, see Elman “Explanatory Typologies in Qualitative Studies of International Politics,” 293-326.

74 Typologies do not handle well variables without fixed boundaries, like the relative logic used in H1 and H2. This is because the “property space” or visual presentation of any explanatory typology is made of rows and columns, each representing a certain value of a discreet ordinal IV or ITV of the theory. Ibid, 296.

75 George and Bennett, 236.
Explaining any phenomenon with eighteen different causal pathways is neither satisfactory nor practical even in a relatively large-N study. The typological technique of “logical compression” is therefore used to cut down the number of pathways leading to a high level of DV. This technique can be used when “there may be a connection between two or more of the typology’s dimensions such that some combinations are logically impossible or highly improbable.” I submit that it is highly improbable that an economy in which private capital has a high strength versus state capital in the overall economy would have a low level of trust in oil markets at the same time. Therefore, those three combinations or cells can be logically eliminated (cell group 1). Following the deductive reasoning underpinning the vulnerability-interaction model, I also argue that it is highly improbable that an economy in which private capital has high strength overall, has a medium level of trust in oil markets AND low or medium OV would adopt a high level of strategic oil supply measures, even with high capability. Therefore, the two cells representing these combinations can be logically eliminated (cell group 2) as illustrated in Figure 2.5 below:

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76 In statistical studies, this causes the degrees of freedom problem. In case studies, this causes the problem of “indeterminacy.” For a discussion of these two issues, see George and Bennett, 26-30.
77 Elman, “Explanatory Typologies in Qualitative Studies of International Politics,” 305.
Five pathways or cells are deleted and 13 pathways leading to a high level of DV remains after applying this compression technique. All these pathways are detailed in Appendix A. The technique of “pragmatic compression,” which means collapsing “contiguous cells if their division serves no useful theoretical purpose,” is applied next. After all the compression is done, two pathways remain: the conditions stipulated as H3 and H4 earlier. Each explanatory variable at its specified level is a necessary condition for each pathway or INUS cause. These pathways are also the “types” of conditions that the vulnerability-interaction model hypothesises that would lead to the adoption of a high level of strategic oil supply measures by net oil importing economies. They are labeled the Three-High type (H3) and the Non-Three-High type (H4).

This concludes the reasoning underlying the vulnerability-interaction model developed in this study. The following section reviews what this author contends to be the most germane literature explaining oil importing states’ intervention in their economies’ oil supply and how this study relates to the literature.

5. Literature on State Intervention in Oil Supply

The literature on state intervention in oil supply in net oil importing most relevant to this study can be roughly divided into two categories. The first is mostly normative: why states should or should not intervene and how. The other is mostly positive: focusing on explaining states’ actions and inaction from observations, evidence and logical deductions.

5.1 Normative Literature

There are two main strands of prescriptive literature: those based on neoliberal economic theories and those taking the Realist or geopolitical perspective. The first strand asserts that governments generally should refrain from intervening in their economies’ oil supply except to liberalise the oil sector or to use “market instrument” affirmatively, such as lowering tariffs on imported oil or subsidies to domestic oil production. Even if there are some negative externalities associated with oil consumption and import, individual governments cannot do much to effectively ameliorate the situation, especially from the

78 Elman, 301.
79 See Appendix A for details of the pragmatic compression process.
81 Ikenberry, “The Irony of State Strength,” 132.
supply side and in the short run. \textsuperscript{83} This is especially true now that oil is a fungible commodity traded in an integrated market.\textsuperscript{84}

Neoliberal institutionalist ideas also underpin research related to oil and energy policies and these writings are at least implicitly prescriptive. They expound the superior allocative power of the market relative to the state, the positive role played by domestic and transnational “market ordering institutions,”\textsuperscript{85} and the positive-sum nature of international trade and cooperation, including oil. \textsuperscript{86} Therefore, these writings provide similar “prescriptions” as those suggested by neoliberal economists.

The Realist or geopolitical perspective normative literature does not offer a unified conclusion on how states should intervene in their economies’ oil supply, but its focus on the connection between dependency on imported oil and national security means state intervention in oil and energy supply is taken for granted.\textsuperscript{87} These writings do not focus on the need to elaborate what cause oil importing states to adopt measures that would enhance their economies’ oil supply. Market measures are accepted as an expedient rather than actively pursued as a matter of principle. Energy is viewed as “a subset of global power politics and a legitimate tool of foreign policy, and [energy security realists] are skeptical of the current energy market’s ability to guarantee long-term supply.”\textsuperscript{88}

\textsuperscript{83} One negative economic externality is inflationary pressure for the whole economy. Bohi and Toma think the development of SPR would only be effective with the coordinated stock drawdown of numerous countries. They also suggest that the only government measure that can address “numerous market failures” is supporting energy research and development that would increase the “price elasticity of either world oil supply or demand.” (“Energy Security: Externalities and Policies,” 1107). Leiby dismisses import tariff as an effective measure to increase energy security as it does not address “the root market failures,” which is “non-competitive global oil supply” and “failure of long-term private oil market transactions to foresee and account for the economy-wide macroeconomic dislocation.” See Paul N. Leiby, “Estimating the Energy Security Benefits of Reduced U.S. Oil Imports,” Oak Ridge National Laboratory, Oak Ridge, Tennessee, February 28, 2007, 12. Also see Jerry Taylor and Peter Van Doren, “The Energy Security Obsession,” TheGeorgetown Journal of Law and Public Policy 6-2 (2008): 475-485.

\textsuperscript{84} Examples of such works include: Dries Lesage \textit{et al.}, Global Energy Governance in a Multipolar World (Surrey, England: Ashgate, 2010); Andreas Goldthaus and Jan Martin Witte ed. Global Energy Governance – The New Rules of the Game (Berlin: Global Policy Institute, 2010).


\textsuperscript{86} Examples of such works include: Robert Gilpin, War and Change in World Politics (Cambridge, UK: Cambridge University Press, 1981), 224. For more contemporary exposition of such approach, see Guo Xuetang, “Energy and Geopolitics in Eurasia,”
A variant of the second strand of normative literature describes one or more states’ oil supply related activities and then prescribe how other state(s) should respond. China and sometimes India or Asia at large is the usual subjects that have their overseas oil supply enhancing activities examined and the United States and occasionally the European Union are the ones receiving the “advice.” These works typically proffer comprehensive measures, such as cooperation in developing alternative energy sources and helping China and other major emerging oil consumers to reduce their demand on hydrocarbons. Michael Klare’s works exemplify this variant of literature despite their very Realist-oriented warnings of conflicts over resources, especially oil, if the eclectic measures prescribed are not taken seriously.

Normative studies based on neoliberal economics can hardly explain why some states continue to intervene in their economies’ oil supply at a high level in the last two decades, nor do they explain the cross-economy variations in the levels of state intervention. Those with a Realist perspective theoretically would explain the high level of state intervention with the strategic importance of oil. It would explain the cross-economy variations in the levels of intervention mainly with the differences in material capabilities among states. In any event, explaining variations in the levels of intervention among states and across time is not the emphasis of this normative literature, but is exactly what the vulnerability-interaction model proposes to explain. The next category of literature reviewed, similar to this thesis, is more interested in understanding the cause(s) of these variations.

5.2 Positive Literature

The positive literature on oil policies has a wide range of scopes and emphases on its explanatory function. Some, especially writings on net oil importing economies in Asia,
remain largely descriptive. These writings are invaluable and form a substantial portion of
the empirical foundation for this project. This section, however, focuses on research that
puts forward explanations of the levels of state intervention in the oil supply sectors of net
oil importing economies, especially at the high level.

Phillip Andrews-Speed, Xuanli Liao, and Roland Dannreuther’s The Strategic
Implications of China’s Energy Needs explains that China adopted a more “strategic” than
“market-oriented” approach to ensure its oil supply since it became a net oil importer in the
mid-1990s (up to when the study was published in 2002) because of rising oil insecurity,
the “predominantly ‘strategic’ orientation” of multiple key energy policymaking actors
without a coherent strategy, and a lack of interest groups that promote “market-driven”
solutions to energy insecurity. The strategic orientation in turn was boosted by a lack of
understanding of how energy markets function, technical and institutional obstacles to
energy sector liberalisation, and NOCs’ preference for the status quo and the strategic
approach. Top party and government leaders, the military, relevant government
departments, and NOCs are considered the key players, while provincial governments and
think tanks are designated as subsidiary ones.

Published in 2011, Andrews-Speed and Dannreuther’s China, Oil and Global
Politics is essentially an updated and more elaborate version of The Strategic Implications.
The authors still try to explain China’s energy policy, especially international oil policy, by
examining the interactions among domestic players who were conditioned by the “wider
context.” This context is supported by a myriad of historical, ideational, institutional, and
external factors, which tend to create a path dependency and feedback effects on each other.
The explanatory function is only one of the two major objectives of both studies. The other,
probably more central, objective is to assess the “political and foreign policy implications”
of the policy and “the challenges this potentially poses for China’s integration into the
international system.” In the latter study, this objective is realised by relating international
relations theories to three possible scenarios that China’s international oil policy could
evolve to more conflictual situations with the West, each taking up a full-length chapter.
The authors are convinced that China’s core objective is still to integrate with the global

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93 Ibid., 43.
94 Ibid., 46-47.
95 Andrews-Speed and Dannreuther, China, Oil and Global Politics, 36.
96 Ibid., ix.
economic and political systems, but at its own pace and manner, while acknowledging that the outlook for such integration is less sanguine than a decade before.97

Øystein Tunsjø’s *Security and Profit in China’s Energy Policy: Hedging Against Risk* argues that the Chinese state adopts a mix of market and strategic oil supply strategies to insure against and manage supply disruption and price volatility risks. It does so because it is uncertain which of these two strategies best enhances its energy security. He introduces the concept of “hedging” akin to the use in finance to explain China’s array of oil supply measures. “Longs” are measures associated with cooperation or positive developments, such as profiting from the market or preventing crises; ‘shorts’ are those “tied to strategic and security considerations,” such as pipelines projects.98 As in financial management, when the economic or political costs of either type of measures become excessive, fewer of that type of measure would be adopted. Tunsjø believes Chinese NOCs are generally driven by profit motive while the government is motivated by security considerations. Therefore, Chinese international oil policy, as suggested in the title of his book, is believed to be driven by both (oil) security and profits. He also differentiates between peacetime risks and wartime threats to oil security and he believes China’s energy security policy “predominately addresses peacetime risks.”99

The first cross-economy comparative study on state intervention in oil supply is Llewelyn Hughes’ *Globalizing Oil: Firms and Oil Market Governance in France, Japan, and the United States*. It explains changes in the degrees of oil market liberalisation in France, Japan, and the United States between 1980 and 2005 by the differing “demands of firms make on governments, and the incentives governments have to meet these demands.”100 Oil firms with different characteristics had different preferences on host economies’ domestic oil market governance against the background of the emergence of the international oil markets. These characteristics were in turn shaped by the industrial compacts negotiated between the firms and the government in an earlier period. The restructuring of the international oil markets in the 1980s is pinpointed as the critical juncture that shaped the current diverging degrees of liberalisation in all three subsequent cases.101

Jeffrey D. Wilson’s *Northeast Asian Resource Security Strategies and International Resource Politics in Asia* does not try to explain the difference in the level of state intervention, but what is instead seen as more or less the same “mercantilist” resource, including oil, security strategies employed by China, Japan, and South Korea over the last

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97 Ibid., 169-190, 2-3.
100 Llewelyn Hughes’ *Globalizing Oil*, 16.
101 Ibid., 68 and 41.
decade. Wilson’s study sees these economies as all adopting a high level of state intervention to ensure oil supply security. The manifestations of this strategy include such measures as investments in “equity resources” by national firms, providing financial and regulatory assistance to national firms, and “resource diplomacy.” In the context of oil, these would all be strategic supply measures as conceptualised in this project. While China’s approach is characterised as the most aggressive, all three countries are seen as motivated by “a deep scepticism in the liberal belief that international markets provide the best guarantee of resource security.” Once triggered by this sense of insecurity, the process of “competitive policy emulation” took over, resulting in the region-wide adoption of this mercantilist strategy.

“Oil & State Capitalism – Government-Firm Coopetition in China and India,” endeavours to understand who exactly are driving China and India’s overseas hydrocarbon investments and what motivate them. In their effort to untangle this puzzle, Jonas Meckling, Bo Kong, and Tanvi Madan adopt the concept of the “polymorphous state” to separate the state from the NOCs - those actually execute and are directly impacted by the investments. The study explains variations in the extent of Chinese and Indian NOC internationalisation by the combined effects of two processes: privatisation/marketisation of these NOCs, and NOC governance reforms in overseas investments.

Privatisation is said to inject NOCs with the entrepreneurial spirit to engage in overseas investments, and the specifics of the governance reform in each country resulted in differences in procedural rules and the bureaucratic capacity of the state to monitor and control its NOCs. The state is conceptualised as playing the roles of both resource supplier, thus providing different levels of cooperation, and veto player, thus creating a certain level of competition to NOCs in the two causal processes. The study concludes that the larger internationalisation scale of Chinese NOCs is due to the Chinese state simultaneously providing high cooperation or being a strong resource supplier and low competition or being a weak veto player to its NOCs. The almost reverse positions of the Indian state in these

103 Ibid, 17.
104 Ibid.
106 Ibid., 1164, 1181.
107 Ibid., 1164-1165.
108 Ibid., 1162-1164.
109 Ibid., 1166-1167.
110 Ibid., 1162-1163.
111 Ibid., 1177-1180.
two roles (moderate resource supplier and stronger veto player) is offered to explain Indian NOCs’ relatively smaller internationalisation scale.\textsuperscript{112}

5.3 Contribution

The literature review on the politics of oil above suggests that this thesis has a broader scope than most existing studies on the subject. This study puts forward an explicit analytical framework to explain variations in the levels of intervention in the oil supply across importing economies, as well as within them over different periods. This is not always found in the existing literature.

In the preliminary cross-economy study in Chapter Three, two major strategic oil supply measures are uniformly examined across nine net oil importing economies stretching from East to Southeast and then to South Asia. This is intended to expand our empirical understanding of oil supply strategies of importing states beyond OECD countries. Data of these economies are collected at 2013 and 2003 to evaluate the cross-temporal dimension of the proposed model. Each data collection point represents roughly a decade of high and low oil prices respectively when the international oil markets have already been well established. The two in-depth paired comparisons presented in Chapter Four and the single-economy investigation presented in Chapter Five of this thesis provide both quantitative and qualitative data on India, Thailand, China, and Taiwan’s oil sectors. The chapters also analyse the strategic oil supply measures these government adopted, especially in the decade preceding 2013.

Tunsjø puts forward a clear analytical framework – that of hedging between risks associated with the market and the strategic approaches to energy/oil security. He suggests that states other than China may also have used the hedging strategy to manage their energy security risks, but investigating that possibility is beyond the scope of his study. Putting aside its scenario-projection and implication section, Andrews-Speed and Dannreuther’s study loosely adopts a historical and institutionalist approach, with the emphases on the role of ideas and perception, contingency, and feedback effects.

None of the single-country studies reviewed here explicitly explains the temporal variations in the levels of state intervention within the economy studied. The two studies by Andrews-Speed \textit{et al} suggest such variations by stressing the evolving and contingent nature of China’s oil policy. The earlier study, however, only covers less than a decade of that policy since China became a net oil importing country, and so there may not be, in any case, enough changes of the factors involved. The latter study covers a period just two years shorter than that examined in this thesis. The authors note that they were surprised by the

\[\text{112 Ibid.}\]
simultaneous fast economic growth of China and the steep rise in oil price between 2002 and 2011, the magnitude of the effect of the former on the latter, and the resulting increased “global salience” of energy security. They insinuate China’s oil supply strategy has been less coherent and less market-driven than they anticipated because of greater constraints from domestic interest groups.

Tunsjø’s study is vague in teasing out any temporal variations of the overall mixes of the strategic and market approaches. For example, Tunsjø says China scaled back diplomatic support to Sudan around 2007 when the political costs of its oil diplomacy towards the country became too high. He focuses the attention on the “hedging” dimension of the incident – reducing the magnitude of the strategic approach or the “short” position - not the temporal variation in the level of strategic measure adopted. Hughes’ is the only study of which I am aware that explicitly examines both temporal and cross-country differences in oil market governance with a clear analytical framework – that of “historical institutionalism.”

The vulnerability-interaction model proposes four major explanatory variables. This means most explanations put forward in the existing literature are not seen as truly alternative causes to state intervention in oil supply. Instead, some of them are at least partially factored in the IV and ITVs of the proposed model. The simultaneous fast economic growth and the steep rise in oil price between 2002 and 2011 in China, and the bargaining strength of domestic interest groups (mostly NOCs) - the “neglected” factors mentioned in Andrews-Speed and Dannreuther’s study - for example, are incorporated into the vulnerability-interaction model. The former may be summarised as changes in OV. The latter is factored in two of the four explanatory variables: as a major component of the overall strength of private capital in the economy and as a securitising agent impacting on decision-makers’ trust in oil markets. If all other factors remain constant, therefore, both a higher OV and the presence of coherent NOCs would result in the adoption of a higher level of strategic oil supply measures according to this study’s model. This appears to be consistent with the observations made by Andrews-Speed and Dannreuther in the case of China during the period of their study. Some exceptions are Wilson’s “competitive policy emulation,” and Tunsjø’s financial-management-style hedging.

This brings up the issue of how unitary and autonomous the state is conceptualised in the existing literature and in this project. Wilson appears to be on the most unitary and autonomous end of the spectrum, from which mercantilist policies can be pursued. Hughes would be on the other end of the spectrum. State/polity actions or inactions are seen as resulting from negotiations with private firms, which in turn were conditioned by the

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structure or restructuring of the international oil markets. The fact that the vulnerability-interaction model consists of one IV and three ITVs means the state’s autonomy is understood as rather circumscribed. Unlike Andrew-Speeds et al., Tunsjø, and Meckling et al., who all highlight the divergence between the state and its NOCs, this thesis does not differentiate the actions taken by them. At the same time, the state/polity is not conceptualised to be as coherent as being able to conscientiously carry out a hedging oil supply management strategy as Tunsjø asserts. It may, of course, scale back or even scrap some measures after it becomes apparent that they have generated undesirable consequences for the polity.

On the other hand, the applicability of industrial compacts between the government and private oil firms as the central explanatory variable in Hughes’ studies is questionable within the scope of this thesis. While IOCs dominated the relatively small oil sectors of some Asian economies during the colonial days and the early years after independence, NOCs had already been established and in some cases entrenched in many of these economies by the time open trading in the international oil markets began in the 1980s.

Meckling et al’s study has a narrow focus – trying to understand the motivation and the scale of NOC internationalisation only. That provides excellent insights into the bifurcation of the state and its NOCs and the dynamics impacting NOC internationalisation in China and India. It is not totally clear, however, if or how the processes described would ultimately affect the overall extent of state intervention in their economies’ oil supply.

I argue that the resource supplier concept in Meckling et al’s study may be loosely understood as the implementation capability ITV in the vulnerability-interaction model, regardless of how that supply of resources was initiated. If we accept that premise as “a close enough” analogy, the prediction of the vulnerability-interaction model actually corresponds to Meckling et al’s conclusion: greater “cooperation” results in larger scale internationalisation. The wider scope covered by the model proposed in this thesis precludes a close equivalent of the veto player concept which specifically refers to the results of NOC governance reforms only.

A pre-requisite of specifically explaining the cross-temporal and the cross-economy variations of strategic oil supply measures adopted is to devise a generally uniform and systematic way of comparing the different levels of them. Among the literature reviewed, Hughes’ is the only study that provides such an indicator. As detailed in Chapter Three, the plausibility probe refines one of the two measures used in Hughes’ study. In spite of this and the shared goal of explaining cross-temporal and cross-economy variations of the degrees of state intervention in oil supply with Hughes’ study, this study theorises perception and ideas as an important intervening variable to the more materialist variables.
In fact, embedded in the ITV of trust in the oil markets, this ideational variable is hypothesised as an *a priori* necessary condition for the adoption of a high level of strategic oil supply measures.

In this regard, Andrews-Speed and Dannreuther’s explanations of China’s energy/oil policy are closer to the essence of the vulnerability-interaction model. This thesis, however, formalises the interaction between these two types of variables to facilitate comparison and testing of hypotheses. In addition, two elements among the variables of this study’s model also mimic the feedback loop and path dependency ideas in their study. First, the presence and coherence of NOCs is theorised as having an impact on trust and hence ultimately on the level of strategic oil supply measures adopted. At the same time, their presence and coherence directly determines the level of strategic oil supply measures. Whether they are present or coherent, therefore, the impact is magnified. Moreover, once they were created, their impact on the DV would be hard to be eliminated. Second, in the scenario where domestic private capital is weaker than both international capital and the state or SOEs (scenario 3), the state/polity’s orientation, meaning the economy’s OV and level of trust in the oil markets, would become more salient. All these elements are organised in a way that facilitates comparison, both across economies and over time. Ultimately, this may be the biggest “innovation” of the vulnerability-interaction model.

6. **Constructivist Approach to State Intervention in Oil Supply?**

The vulnerability-interaction model presented in this chapter emphasises the effect of interaction among four explanatory variables on the level of state intervention in the oil supply in net oil importing economies. Two of these variables, trust in oil markets and strength of private capital, incorporate some non-material elements in their formulation. For this reason, this section tries to clarify the extent the model can be viewed as having a constructivist approach to state intervention in oil supply. The discussions below suggest that the model in its entirety, as currently conceptualised, situates closer to the conventional realist than the constructivist end of the theoretical spectrum.

The different strands of the constructivist approach to international relations converge on the following commonalities:114 They see agents and structures as mutually constitutive; the consequences of anarchy as socially constructed instead of preordained; state identities and interests as variables, not as fixed givens; and both material and

discursive capabilities as sources of power.115 These four major features of the approach are used to focus the discussion on how constructivist the vulnerability-interaction model is.

**Mutually Constitutive Agents and Structure.** The most important agents examined in the proposed model are net oil importing economies as personified by national-level decision-makers in their economies’ oil supply, and more broadly, economic policymaking. The most pertinent structures include the international oil market, the power distribution in the international system, and existing domestic oil market governances during the period studied. The independent variable of OV as currently conceptualised offers only little to moderate room for mutual constitution between these agents and structures. It is in the concept of market risks that very large net oil economies would have noticeable impact on the international oil market, and more indirectly and less certainly, on the overall power distribution in the international system. These economies would be vulnerable to market risks when global oil supply is tight but also wield market shaping power when there is an oil glut.

At the domestic level of analysis, the agents of large private oil firms and NCOs and the structures of both the domestic oil markets and the national governments of economies generally have more mutual influence on each other’s behaviour than at the international level. The explanatory factors of decision-makers’ trust in their domestic oil markets and private capital strength in their economies are predicated on this domestic level mutual constitution. Agent-structure mutual constitution does not directly concern the variable of OV or implementation capability.

**Socially Constructed Consequences of Anarchy.** The price-setting mechanism of the international oil market is “governed” by demand and supply dynamics, not anarchy. Just as many other markets in the real world, however, it is far from having “textbook” perfect market conditions, such as being populated by a large number of buyers and sellers of similar sizes with perfect information. Besides, the current international oil market has been adopted as the primary mode of exchange of oil across national borders relatively recently and is still evolving. The vulnerability-international model argues that more opaque modes of international oil exchange that were more directly tied to the power distribution in the international system, therefore, still cast a shadow over decision-makers’ trust in the current international oil market. This doubt could be exploited and magnified with effective securitisation of oil supply – a concept closely associated with the constructivist approach.116

Unlike the constructivist approach, however, the proposed model sees the impact of anarchy on decision-makers’ trust in the international oil market as springing from only

115 Hopf, ibid, 185.
one understanding of anarchy – the realist or Hobbesian understanding. Their trust in the international market is predicated on the quality of their relationship with the presumed system leader, and hence how acute the political entity’s competition for survival or leadership with this “hegemon” is. Yet, this understanding of the consequence of anarchy is not seen as preordained as realism postulates. Indeed, it has been tinkered by rule-based and transparent regimes as postulated by neoliberalist theorists, especially in economic domains. The vulnerability-interaction model is formulated with the observation that a widely shared understanding of anarchy that is vastly different than the realistic one, has not emerged and the assumption that it would not emerge in the near future in the Asia Pacific. The nature of anarchy does not really concern the other explanatory factors.

Variable State Identities and Interests. Following the reasoning of the mutual constitution between agents and structures and the power of discourse, the constructivist approach sees that states may have multiple and changing identities and hence interests and behaviour that are associated with the various identities through intersubjectivity. Overall, the vulnerability-interaction model assigns relatively fixed identities and interests to political entities regarding their oil supply policies. A political entity is conceptualised to identify itself as a net oil importing or net exporting economy largely based on the material factor of whether it produces more oil than it consumes during a given time period. The interests generated from the identity of being a net importing economy are also largely the same: to secure the most affordable, efficient, and stable supply of oil to the economy. More perceptual elements, however, are involved in determining the best course of actions to safeguard these interests.

The proposed model suggests decision-makers’ different understandings of the best combination of market and non-market measures to realize the same interest and identity as net oil importing economies in addition to individual economies’ implementation capability and OV translate into the different levels of strategic oil supply measures an economy adopts at any given time. These understandings may be skewed by securitisation of oil supply to lower decision-makers’ trust in the effectiveness and/or fairness of oil markets, but they would not be totally divorced from the material, institutional, and historical realities of the

117 Alexander Wendt, considered a “standard bearer” of conventional constructivism, for example, suggests that actors (states) may understand anarchy as Hobbesian, Lockean, or Kantian depending on how they see themselves and others in the international system. These different approaches to anarchy would generate very different consequences even when the international system remains anarchic. See Social Theory of International Politics (Cambridge University Press Virtual Publishing, 2003), 246-312.

118 As discussed in Chapters Three and Six in this thesis, a perceptual lag to this material rule is likely to linger in cases when an economy has recently transitioned from a net producer to a net consumer, as in the case of Indonesia during the period studied.
economies. This leads to the assessment of how much power the vulnerability-interaction model assigns to discourse and through which type of securitisation.

**Sources of Power.** The constructivists approach sees material and discursive capabilities as intertwining sources of power, more so than the realist school of thoughts. This relative emphasis on the power of discourse contributed to the conceptualisation of securitization theory, first developed by a group of scholars commonly referred to as the Copenhagen School (CS). According to this often cited formulation of securitization theory, an issue may be securitized as an existential threat that calls for extraordinary measures simply by the “speech act” of proclaiming and presenting it as such. As discussed in Section 3.2 earlier in this chapter, the vulnerability-interaction model proposed in this study, however, has adopted a more recently developed approach to securitisation theory put forward by Balzacq. This approach emphasises the impact of external contexts and the status of securitising agent(s) vis-à-vis the targeted audience on successful securitisation, in addition to the performative act of speech. This approach is one of the more “practice-based” strands versus the more “linguistic” approach to securitisation as represented by the original CS formulation.

For the explanatory factor of trust in oil markets, therefore, the model proposed in this thesis takes a largely constructivist approach that discursive and material capabilities are equally important sources of power. This combined power is channelled through securitisation to cause different levels of trust among decision-makers as the success of this process is contingent as much on external contexts as the power relations between agents and audience of securitisation, as the speech act of uttering the supposed threat itself. Securitisation theory, particularly the more practice-based strand adopted in this thesis, is suited to such an application as it

… claims that the intersubjective representation of reality (constructivism about facts) is not necessarily incompatible with the possibility that some

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119 There are important exceptions to mainstream approaches’ “neglect” to ideational or perceptual variables to international relations. Examples include Robert Jervis’ study on the role of perception in decision-making in *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 2015); Joseph Nye’s examination of soft power in *Soft Power: The Means to Success in World Politics* (New York: Public Affairs, 2004); and Judith Goldstein and Robert Keohane’s discussion and compilation of works on how ideas shape foreign policymaking in the volume they edited: *Ideas and Foreign Policy* (Ithaca: Cornell University Press, 1993).

120 Securitization theory incorporates elements of realism and poststructuralism as well as constructivism and has developed into a number of strands, even if “linkages between securitization theory and other theoretical enterprises remain largely under-studied and under-specified.” Thierry Balzacq, Sarah Léonard, and Jan Ruzicka, “Securitization revisited: theory and cases,” *International Relations*, 30-4 (2016), 518.


122 For a discussion of the categorization and its limit of various strands of securitization theory, see Balzacq et al “Securitization revisited” 498-499.
features of the world, independent from people and their beliefs about those, are capable of explaining why a community holds that something is a threat (objectivism about rational explanations) … [and it] relate[s] language and mind to the impact of the external world on regulating the content of the two.¹²³

Overall, the vulnerability-interaction model shares more features with the realist than the constructivist approach. Not much mutual constitution is conceptualised to take place between individual net oil importing economies (agents) and the international oil market or the international system at large (structure). In the case of the few very large net oil importing economies, the influence they have on the structure is understood as materialist rather than ideational in origin. There would be more mutual constitution at the domestic level, but the oil supply strategy of net oil importing economies are usually more externally-oriented.

The proposed model also assumes net oil importing economies as having similar realist understanding of the consequences of anarchy as well as the same interests and identities in formulating their oil supply strategies. Decision-makers’ trust in the oil markets’ capability in ensuring their economies’ oil supply security is the only explanatory variable that has a significant perceptual or ideational element factored in it. Discourse is conceptualised to manifest its power through a process more akin to the pragmatic than the linguistic approach of securitisation theory put forward by the CS to determine the ultimate trust level.

The empirical chapters of this study, previewed in the next section, suggest that this variable played a critical role in eventuating the level of strategic oil supply measures Asian net oil importing economies adopted during the period studied. Still, the vulnerability-interaction model takes a more “fleshed-out” or “realistic” realist approach à la Jervis and Goldstein and Keohane than an outright constructivist approach with its preponderance of materialist variables and its presumption of the mostly realist understanding of anarchy among the economies examined.¹²⁴

7. Empirical Strategy

This section maps out the empirical strategy to test the validity of the four hypotheses generated by the vulnerability-interaction model. The model is largely deductive and has not been tested with empirical cases. This thesis will, therefore, first conduct a

¹²³ Ibid, 519.
plausibility probe to verify its plausibility with a relatively larger number of cases, but less in-depth data. This helps to determine if “more intensive and laborious testing is warranted.”

Plausibility probe is one of the six theory-building case study research objectives George and Bennett identify. Given the Asia-Pacific focus of this study as discussed in Chapter One, the first step towards testing the model is to determine economies to include in the plausibility probe in Chapter Three.

What constitutes a “region” has always been a contested concept and what constitutes the Asia-Pacific is no exception. This thesis takes a pragmatic approach in case selection by trying to include as many net oil importing economies as possible in the plausibility probe where relatively reliable data on energy and oil production, consumption, and supply are available. The BP Statistical Review of World Energy, published annually during the two decades covered by this project and beyond, therefore, becomes the starting point. Data of 16 economies are grouped under “Asia Pacific” in the June 2014 edition of the review, which covers data up to year 2013. Of the 16, Malaysia and Vietnam are eliminated because their status as net oil importers as of 2013 is ambiguous. Bangladesh, Pakistan, and China Hong Kong SAR, are eliminated due to the relative lack of data upon initial research. Finally, Australia and New Zealand are also excluded. These two economies are more geographically remote and distinct from the rest of the group. Besides, although Australia is a net oil importer, it is also a net energy exporter. This may give decision-makers a different perspective on oil supply security issues. In the end, nine economies, which are what remain from the original 16 after these adjustments are made, are sufficiently large scale for this project to assess.

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125 George and Bennett, 75.
126 The other five objectives they identify are: atheoretical/configurative idiographic, disciplined configurative, heuristic, theory-testing, and “building block” studies of particular types or subtypes. See Case Studies and Theory Development in the Social Sciences, 74-75.
128 BP Statistical Review of World Energy, June 2014, 9. The 16 economies are: Australia, Bangladesh, China, China Hong Kong SAR, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam.
The method of structured and focused comparison is used to make pairwise comparisons among the chosen nine economies in the plausibility probe to examine the validity of H1 to H2: China, India, Indonesia, Japan, the Philippines, Singapore, South Korea, Taiwan, and Thailand. Year 2013 data are used to test the cross-economy dimension of these two hypotheses. The same data are compared with year 2003 data of each economy to test the cross-temporal dimension of the hypotheses. These two years each presents roughly a decade of high oil prices (2004-2013) and a decade of low oil prices (1994 – 2003) that cover the entire period of this study.

Nine “within-case comparisons” are made with the levels of the explanatory variables in these two years to see if they are congruent with the levels of the DV as predicted by H1 and H2. According to George and Bennett, “there is a growing consensus that the strongest means of drawing inferences from case studies is the use of a combination of within-case analysis and cross-case comparisons within a single study.” Due to time and length restraints, however, the cross-temporal dimension of the vulnerability-interaction model is investigated only in the plausibility probe.

Structured and focused comparison involves finding answers to standardised questions pertinent to the research objective. Two major strategic oil supply measures are used to comprise an indicator to uniformly assess the levels of these measured adopted, the DV, in each of the nine cases with 2013 and 2003 data. Two market and two supply risks make up another indicator for OV, the IV of the vulnerability-interaction model. In the plausibility probe, only the historical-institutional source of the overall private capital strength is investigated. Two “off-the-shelf” indicators are used to evaluate the degrees of overall economic freedom and openness of the cases. The exact sources and methods of these indicators are discussed in the Chapter Three, but it suffices to say here that the creation of these indicators amounts to answering the same questions in the most standardised way possible.

All the data are reviewed and cross-compared to evaluate the *prima facie* validity of H1 to H4 and to choose the best cases for further investigation. H2 means that candidates for further investigations of the hypothesis would fall into a loose definition of the most similar cases - all explanatory factors of interest being similar except the theorised ones but with different outcomes (DV).

Once the best candidates are chosen from the plausibility probe, the same structured and focused comparison method is used to conduct more in-depth examination of

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131 George and Bennett, 18.
132 George and Bennett, 70.
the cross-economy validity of H1 and H2. Measures and evidence that are more unique to
the cases and are difficult to quantify, but are consistent with the logic of the model are taken
into consideration in these comparisons. These include speeches of decision-makers and
stakeholders concerned, information on government ministry and NOC websites, policy
directives and guidelines, media reports, and existing scholarly and policy studies. Simple
content analyses of the annual reports of the relevant NOCs in the relevant years are
conducted to investigate the NOCs’ securitising effort or lack thereof.

Before H3 and H4 or the second layer of the vulnerability-interaction model can
be tested, economies that have adopted a high level of strategic oil supply measures must
first be located. Data generated in the plausibility probe serve as the basis for the search.
This is justified as even casual observers would agree that economies that have adopted a
high level of strategic supply measures among a cohort of nine Asian net oil importing
economies are likely to be qualified as adopting a high level among any cohort of net oil
importing economies in the world. Once a case is found to have a high DV in the plausibility
probe, the levels of all its explanatory variable are examined to see if they correspond to
those specified in either H3 or H4.

The plausibility probe located China with 2013 data as having the exact
configuration as stipulated by H4. None of the cases, however, matches the configuration of
H3. Among the three closest contenders, Taiwan is chosen for an in-depth case study to
investigate the validity of H3. Since one of the purposes of this study is to “probe new
explanation for Y,”134 the pathway leading to the adoption of a high level of strategic oil
supply measures, Taiwan is examined as a deviant case study.

No further investigation is conducted on China for H4 since it is already compared
with India for the in-depth study of H2 in Chapter Four. As the literature review above
suggests, many aspects of China’s oil supply strategy in the last two decades have been
examined within existing relevant literature, even if they apply a different analytical
framework.

This concludes the empirical strategy to test the validity of the vulnerability-
interaction established. The next chapter will present the plausibility probe of the entire
model.

134 Ibid., 297.
Chapter Three
Plausibility Probe of Vulnerability-Interaction Model

1. Introduction

This thesis proposes the vulnerability-interaction model to explain the puzzling phenomenon of net oil importing states’ continued but different levels of intervention in how oil is supplied to their economies. In this chapter, I measure the key independent (IV), intervening (ITV), and dependent variables (DV) for nine Asian net oil importing economies, and use these measures to probe the plausibility of the layers and dimensions of the model.

As noted in Chapter Two, the first layer is designed to examine what caused Asian net oil economies to adopt different levels of strategic oil supply measures from each other, and across time, within the period of 1994 to 2013. The second layer of the model explores factors driving some of these economies to adopt a high level of such measures during the same period.

H1 states that if the levels of all four explanatory factors are similar in two cases, the value of their DV should be similar. H2 states that if the levels of three of these factors are similar in two cases, their DV levels should be congruent with the result caused by the difference in their fourth factor as predicted by the model. These hypotheses are tested using two empirical strategies. First, they are tested for their cross-case validity with pairwise comparisons among the nine economies of China, India, Indonesia, Japan, the Philippines, Singapore, South Korea, Taiwan, and Thailand with 2013 data. Second, these two hypotheses are subsequently tested for their cross-temporal validity with the same nine economies. Each of the nine within-case studies compare the 2003 data and the 2013 data longitudinally, representing a decade of relatively low and high oil prices respectively.

This enables me to achieve two goals. First, the testings of H1 and H2 probe the explanatory power of my model. Second, they assist in my case selection strategy, by helping me identify which economies have adopted a high level of strategic oil supply measures. These cases are then used to gauge the validity of H3 and H4. Then the best cases to conduct in-depth studies on the cross-case dimension of H1 and H2 and on H3 are identified.

The following section in this chapter presents data to facilitate cross-case comparisons related to H1 and H2. Section 3 presents the preliminary results of the cross-case study in Section 2, which provide good support to the vulnerability-interaction model. Section 4 presents nine within-case studies related to the cross-temporal dimension of H1 and H2. Section 5 examines the overall validity of all the dimensions and layers of the model.
and justifies the selection of cases for more in-depth investigation of the model in Chapters Four and Five. Section 6 concludes with discussions on how the vulnerability-interaction model compares with applicable alternative theories and initial observations gleaned from this plausibility probe.

2. Measuring Key Variables, Testing H1 and H2 Through Cross-Case Comparison

This section weighs the same set of questions of each of the nine Asian net oil importing economies with 2013 data. Each of the following questions probes a key variable of the vulnerability-interaction model and thus helps determining the cross-case validity of H1 and H2.¹

The questions asked of each case are:

1. What was the level of strategic oil supply measures adopted by the state in 2013? (i.e. measure DV)
2. What was the economy’s oil vulnerability (OV) in 2013? (i.e. measure IV)
3. What was the strength of the private capital in the economy, in the form of its degree of overall economic freedom and openness in 2013? (i.e. measure ITV1)
4. What was the decision-makers’ level of trust that oil markets can adequately provide oil security? (i.e. measure ITV2)
5. In 2013 what was the state’s overall capability to implement strategic oil supply measures? (i.e. measure ITV3)

Each of these questions aims at measuring the level of one variable (DV, IV, and ITVs respectively) within the overall model. Sections 2.1 to 2.5 below justify and apply a series of measures that are used for variables in the order of the questions listed above.² Then preliminary tests of hypotheses 1 to 4 developed in Chapter Two are carried out.

The year 2013 is chosen as a critical benchmark because it ended a decade of mostly rising oil prices.³ Many strategic oil supply measures, including those used to gauge

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¹ George and Bennett describe the essence of structured, focused comparisons as being uniform and theory-centric. 68.
² This study uses the “indicator approach” to provide preliminary answers to the first three questions. The indicator approach tries to operationalise and measure the latent variables or the “constructs” representing the real phenomena of interest. The sections providing answers to the last two questions take an approach closer to what Gary Goertz and James Mahoney call the “semantic approach.” Goertz and Mahoney, A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences (Princeton: Princeton University Press, 2012), 127-128. For a discussion of latent variables, see Kenneth A. Bollen, “Latent Variables in Psychology and the Social Sciences,” Annual Review of Psychology (2002) 53, 607-608.
³ For graphs showing the dramatic drop of the prices of both the Brent crude and the West Texas Intermediate crude in 2014, especially in the fourth quarter, see “Crude oil prices down sharply in fourth quarter of 2014,” U.S. EIA website, assessed 1 April 2016, [https://www.eia.gov/todayinenergy/detail.cfm?id=19451](https://www.eia.gov/todayinenergy/detail.cfm?id=19451). For an annotated graph showing the history of crude oil prices, including the twenty-year period covered in this study, see “An Annotated
the measures adopted in this project, have a relatively long lead time. Therefore, data for 2013 is an appropriate representation of oil supply security decision-making during a period of high oil price.

2.1  **Dependent Variable: Strategic Oil Supply Indicator**

The strategic oil supply indicator has been created here to assess the level of strategic oil supply measures adopted by the state in question. Two measures make up this composite indicator: 1. percentage of government control of the economy’s crude oil supply; and 2. size of the economy’s strategic petroleum reserves (SPR).

2.1.1  **Justification**

A composite indicator is used in this study to allow for the consideration of diverse manifestations of the key concept to be measured: state intervention in oil supply. Two measures are chosen in this plausibility probe because both are relatively easy to quantify and normalise, and are widely adopted in the Asia-Pacific region.

The most common way for a state to control the crude oil supply to its economy is through control of its NOC(s) by holding shares of it. It may be true that some NOCs are sometimes driven more by profit-seeking than ensuring their host countries’ oil security since most NOCs are theoretically responsible for balancing their own finances. Nonetheless, NOCs are still rivals to private oil firms often operating in the same country, which are unlikely to have the same level of access to policymakers. In fact, senior managers and board of directors of some NOCs also formally or informally help formulate the country’s oil supply policies. SPRs and oil stockpiling of NOCs are less obviously market-displacing. The drawdown procedures of some countries’ SPR, such as those of the United States, appear to be mostly market-conforming. The adoption of these two strategic oil supply measures, however, does reflect a certain degree of state intervention oil markets. It is argued here that a composite indicator resulting from these measures captures different forms of state intervention in oil supply in different economies.

An alternative measure is *oil diplomacy* which is defined as “using preferential and politically-negotiated relationships” in the hope of increasing the oil supply security of

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the initiating state.\textsuperscript{6} Data on how many incidents of such policy actually took place and when is scarce, however. In addition, simply tallying up incidents of oil diplomacy manoeuvres can only measure their frequency but not “magnitude.” Overseas equity oil exploration and production (E&P) projects by NOCs is a second potential measure. Some studies point out that NOCs of Asian net oil importing economies engaging in these projects are motivated by profits, not geopolitical or strategic concerns.\textsuperscript{7} Regardless of the motives of these pursuits, they still fall within the definition of strategic oil supply measures in this study.

2.1.2 Component 1: Government Control of Crude Oil Supply
The first component of the strategic oil supply indicator is the percentage of state control of crude oil supplied to an economy. This analysis considers a government as controlling a particular amount of crude oil if that amount is developed or procured by a company in which the state has majority ownership. Alternatively, crude oil is developed by an oil E&P project the government has funded directly or indirectly by guaranteeing the loan for its financing. The first of these measures appears to be the most market-displacing of strategic oil supply measures except for military interventions. The second one is slightly less distorting as private oil firms, instead of NOCs, are the instruments that actually bring in the oil.\textsuperscript{8}

The easiest cases to determine this percentage are economies not having any NOCs nor funded oil E&P projects. Singapore was the only case-study economy reviewed here that did not have a NOC of any form in 2013, nor did it fund or guarantee funds to such projects by private oil companies as in Japan.\textsuperscript{9} The Philippines does have a Philippine


\textsuperscript{8} In compiling the percentage of government control, however, this slight difference in the degrees of market-distortion is not differentiated in this indicator.

\textsuperscript{9} Despite its NOC-sounding name, the Singapore Petroleum Company (or more commonly known as SPC) was no longer owned by the government of Singapore in the decade leading to 2013. Instead, its 45% shareholder is PetroChina, an oil firm majority-owned by the largest Chinese NOC, China National Petroleum Corporation (CNPC). See “PetroChina Acquires Keppel’s Entire Stake in Singapore Petroleum Company,” accessed 19 August 2015, http://www.petrochina.com.cn/ptr/xwxx/201404/b5b2d5b3773c4fe49d06294928a0c366.shtml.

It should also be noted that oil produced by companies that sovereign wealth funds invested in are not counted in this first component as typically investment decisions of these funds are not made by national decision-makers. Singapore’s sovereign wealth fund Temasek did and does invest in upstream oil firms, but “[u]nder Singapore’s Constitution and laws, neither the President of the Republic of Singapore nor the Singapore Minister for Finance, our shareholder, is involved in our investment, divestment or other business decisions,” “Corporate Governance,” Temasek, accessed 20 September 2015,
National Oil Company (PNOC), but it did not produce or procure any crude oil for the country in 2013.\textsuperscript{10} Oil exploration service contracts the Philippine government signed with E&P companies to develop the country’s small but still available indigenous resources, however, stipulate a 60/40 ratio of division (after costs) in the government’s favour.\textsuperscript{11} That is how the Philippine government still has a certain control over the country’s crude oil supply.\textsuperscript{12}

China and Indonesia are also relatively easy cases. In China, the state still controlled almost 100% of the country’s crude oil supply in 2013. NOCs were almost the only companies granted import licenses to import crude oil to the country.\textsuperscript{13} Indigenous oil E&P was overwhelmingly dominated by 100% state-owned NOCs and their subsidiaries.\textsuperscript{14} Although three such subsidiaries have been publicly traded since the turn of this century, the parent NOCs still held between 65 to 86% of these companies’ shares and had a tight grip on their management.\textsuperscript{15} In addition, all five companies that held licenses to import crude oil into China were 100% state-owned and the situation only began to change in 2014.\textsuperscript{16}

In Indonesia, the state can be said to control 100% of the crude supply to the economy. Although the 100% state-owned NOC Pertamina only produced about 17% of the

\begin{footnotesize}
\begin{enumerate}
\item The exploration entity of the company only conducted seismic data acquisition and other studies “in preparation for well drilling activities.” \textit{Philippine National Oil Company 2013 Annual Report,} 4.
\item The default option is for the government to take the oil developed in proceeds from the 60% of oil developed and marketed by the oil firm, but it can also elect to receive its share in kind, too. It is through this way that the Philippine government can control the supply of the crude oil in the country. See a model oil service contract on the Philippine Department of Energy website, accessed 30 March 2016, \url{http://www.doe.gov.ph/pecr5/index.php/petroleum/petroleum-model-contracts}.
\item The first private energy firm that applied for and obtained a relatively small crude oil importing license in China was Guanghui Energy in 2012. See Tim Daiss, “China State-Owned Oil Monopoly System to Slowly Change,” \textit{The Energy Tribune} website, 4 July 2013, accessed 12 August 2015, \url{http://www.energytribune.com/77959/china-state-owned-oil-monopoly-system-to-slowly-change#slash.o2zlnfLm.dpbs}. Also see “China Opens up crude oil import to private refineries,” Xinhua News Agency website, 24 July 2015, accessed 11 August 2015, \url{http://www.chinadaily.com.cn/business/2015-07/24/content_21393937.htm}.
\item CNPC, the biggest 100% state-owned NOC, and its 86% owned subsidiary PetroChina together account for about 54% of China’s crude oil output and IOCs are only taken on as minority partners in offshore oil and gas E&P projects. See U.S. Energy Information Administration report on China, last updated 14 May 2015, 5.
\item According to the 2013 annual reports of these three subsidiaries, the shareholdings of these companies by their 100% state-owned parents were (listed in descending order of the companies’ crude production): PetroChina - 86.51% (page 15), Sinopec Corp. – 73.96% (page 6), and CNOOC Ltd. – 64.66% (page 57).
\end{enumerate}
\end{footnotesize}
indigenous crude through 2012,17 Pertamina “owns and operates eight of the country’s nine oil refineries (the ninth is owned by the Research and Development Agency of the Agency of Department of Energy and Mineral Resources).”18 This refining capacity only covers about 64% of the country’s consumption needs and so the shortfall is covered by imported oil products.19 Therefore, all the crude oil supply to feed the refineries in Indonesia (from either domestic or overseas sources) was acquired by state-controlled or funded entities.

The calculation of the first component of the strategic oil supply indicator for five of the remaining six case study economies conforms to a two-step process. These five economies are India, South Korea, Taiwan, and Thailand. Japan is the other remaining case study and will be addressed below. First, the percentage(s) of shares the state owns in NOC(s) is obtained (a). Then the crude oil produced and imported by these company(ies) in 2013 as a percentage of total oil consumption of the economy in the same year is calculated (b).20 The final figure of the percentage of state control of the economy’s crude oil supply is obtained by multiplying (a) with (b). The Philippines’ NOC did not produce or procure any crude oil in 2013, but the government’s share of oil developed by private firms in the country is used to do the computation instead.21 Details of calculation are listed in Table 3.1 below:

<table>
<thead>
<tr>
<th>Country</th>
<th>Govt of NOC's Oil Consumed</th>
<th>Oil Produced or Procured (million tonnes)</th>
<th>% of control of oil consumed</th>
<th>% of state control</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17 For the shareholding percentage of the state, see Pertamina EP Integrated Annual Report 2013, 14.
18 For the company’s domestic crude production share, see “Indonesia Country Report,” U.S. Energy Information Administration (EIA) website, last updated March 5, 2014.
20 The oil and consumption and production figures of all case-study economies in this study come from BP Statistical Review of World Energy of various years of except otherwise noted. These figures may have slight discrepancies from national figures, but having the consistency of all data available in the same units of measurement is a major benefit that greatly facilitates comparisons across nine economies.
21 PNOC’s 2013 annual report does not mention any actual oil produced or procured by itself or its upstream subsidiary, PNOC EC. It only mentions the production of natural gas. See page 6 of the report.
22 The five companies included in this study are the biggest NOCs and their subsidiaries or affiliates that produce or procure crude oil in India. The Gas Authority of India Limited, which only engaged in the production and distribution of gas, is not included. All five are central-level public sector enterprises (CPSEs). For a list of such CPSEs as of 2014, see “List of Maharatna, Navratna and Miniratna CPSEs,” Department of Public Enterprises of India, accessed 20 April 2016, http://dpe.nic.in/publications/list_of_maharatna_navratna-and_miniratna. The first three listed are mostly oil marketing companies (OMCs), meaning mid- to downstream oil firms, but control crude oil supply in India by procuring it from various sources to feed their refineries. For these companies, only the crude they import is counted in this study to avoid double counting, unless evidence clearly shows otherwise. This is because their domestic crudes are likely supplied by Oil India or ONGC since these two integrated firms do not have much refinery capacity of their own. Oil India only holds 26% equity in Numaligarh Refinery Limited. See “Profile,” Oil India Limited website, accessed 20 April 2016, http://www.oil-india.com/Profile.aspx.
<table>
<thead>
<tr>
<th></th>
<th>(million tonnes)(^{23})</th>
<th>Oil Produced in 2013 (thousand barrels daily)(^{36})</th>
<th>% of state control of oil supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bharat Petroleum</td>
<td>55.79(^{24})</td>
<td>22.79(^{25})</td>
<td>9.70</td>
</tr>
<tr>
<td>Hindustan Petroleum</td>
<td>51.11(^{26})</td>
<td>15.41(^{27})</td>
<td>8.79</td>
</tr>
<tr>
<td>Indian Oil Corporation Ltd. (IOCL)</td>
<td>78.92(^{28})</td>
<td>42.53(^{29})</td>
<td>24.27</td>
</tr>
<tr>
<td>Oil India</td>
<td>68.43(^{30})</td>
<td>3.66(^{31})</td>
<td>2.09</td>
</tr>
<tr>
<td>ONGC &amp; ONGC Videsh</td>
<td>68.94(^{32})</td>
<td>31.49(^{33})</td>
<td>17.97</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>44.72</strong></td>
<td><strong>44.72</strong></td>
<td><strong>44.72</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>% of Government Share of Oil Developed(^{34})</th>
<th>Oil Consumption in 2013 (thousand barrels daily)(^{35})</th>
<th>Oil Produced by KNOC in</th>
<th>% of state control of oil supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>60</td>
<td>298</td>
<td>26</td>
<td>5.23</td>
</tr>
<tr>
<td>South Korea</td>
<td>% of Government Share of Oil Consumption in 2013</td>
<td>Oil Produced by KNOC in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{23}\) BP Statistical Review of World Energy June 2014.
\(^{24}\) Bharat Petroleum Annual Report 2013-14, 77. Only the shares held by the Government or President of India and the State Government (in this case the Government of Kerala) are counted, not other CPSEs. Many CPSEs are not 100% government-owned. More importantly, if they are not related to the oil sector, they are just passive investors, unlikely to interfere with the management decisions. If they are oil sector CPSEs, such as the Indian Oil Corporation in the case of ONGC, counting them would be tantamount to double counting. The same rule will be applied to all the companies listed here.

\(^{25}\) Ibid., 52. This includes both its domestic production from Mumbi High and its crude import in year 2012-13.

\(^{26}\) Hindustan Petroleum Corporation Annual Report 2012-13, 73.

\(^{27}\) Ibid., 36. This includes both imported crude and domestic crude Hindustan Petroleum “uplifted” in three specific fields.

\(^{28}\) Indian Oil 2013-14 Annual Report, 87. According to the note on this page, up to 13 March 2014, the President of India was holding 78.92% of the company’s shares. Then on 14 March 2014 he divested 10% of the shares in favour of ONGC and 5% to Oil India Ltd. The 78.92% figure for year 2013 is used in this study.

\(^{29}\) This is the amount of crude imported by the company in 2012-13, which is not from domestically produced oil and most likely not bought from ONGC. The company’s crude throughput for its refineries during the same period is 54.65 million tons. The difference of these two figures is likely from domestic production or bought from ONGC. In using the smaller of the two amounts, there is not any double counting. The sources of the two figures are from page 38 and 44 respectively of the India Oil 2013-14 Annual Report.

\(^{30}\) Oil India Limited 2013-14 Annual Report, 70.

\(^{31}\) Oil India Limited 2013-14 Annual Report, 11.

\(^{32}\) Oil and Natural Gas Corporation Limited Annual Report 2013, 136.

\(^{33}\) Ibid., 53.


\(^{35}\) BP Statistical Review of World Energy June 2014.

Table 3.1  State Control of Crude Supply in India, Philippines, South Korea, Taiwan and Thailand in 2013

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Government Share of NOC</th>
<th>Oil Consumption in 2013 (thousand barrels daily)</th>
<th>Oil Imported by NOC in 2013 (thousand tonnes)</th>
<th>% of state control of oil supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>100</td>
<td>2,460</td>
<td>220</td>
<td>8.94</td>
</tr>
<tr>
<td>Thailand</td>
<td>51.11</td>
<td>1,211</td>
<td>1,004</td>
<td>42.37</td>
</tr>
</tbody>
</table>

The case of Japan is somewhat different and therefore, the method of ascertaining the state control of the country’s crude oil supply is also different. In 2013, Japan did not have a “traditional” NOC comparable to those of its Asian peers. Japan Oil, Gas and Metals National Corporation (JOGMEC), a public entity tasked to “ensure a stable, inexpensive supply of oil” does not engage in oil E&P or procurement directly. Instead, it provides financial assistance to oil E&P projects of Japanese oil firms in the form of equity capital and liability guarantees. Therefore, literature on Japanese oil security normally uses the term “self-developed oil” or “equity oil” to describe oil produced as a result of such financial assistance. The amount of this self-developed oil “has hovered between 10 and 15 per cent

42 The CPC Corporation imported 139.9 million barrels of crude oil into Taiwan for refining in 2013. See CPC 2014 [Annual Report], 12. This number is converted into tons by using the BP conversion formula of one barrel equals 0.1364 ton. See BP Statistical Review of World Energy June 2014, 44.
43 PTT Annual Report 2013, 130.
[of Japan’s total import] over the past decade.” As Japan practically imports all of its crude oil, this also equals the percentage of its consumption. Using the historical figure for the last decade as a guide, this project will adopt 11% as the amount of crude oil supply “controlled” by the state.

Table 3.2 below recaps the results of the first component of the strategic oil supply indicator of all nine case study economies:

<table>
<thead>
<tr>
<th>Economy</th>
<th>% of government control of crude oil supply in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>99</td>
</tr>
<tr>
<td>India</td>
<td>45</td>
</tr>
<tr>
<td>Indonesia</td>
<td>100</td>
</tr>
<tr>
<td>Japan</td>
<td>11</td>
</tr>
<tr>
<td>Philippines</td>
<td>5</td>
</tr>
<tr>
<td>Singapore</td>
<td>0</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
</tr>
<tr>
<td>Taiwan</td>
<td>44</td>
</tr>
<tr>
<td>Thailand</td>
<td>42</td>
</tr>
</tbody>
</table>

Table 3.2  State Control of Crude Oil Supply in Case-Study Economies in 2013

2.1.3 Component 2: Size of Strategic Petroleum Reserves

The second component of the strategic oil supply indicator is the size of countries’ SPR. As mentioned earlier, generally maintaining an SPR is more market-conforming than the first component. Even the major oil consuming organization of the more liberal OECD economies, the International Energy Agency (IEA), approves of this measure as a way to achieve oil supply security. Using this strategic supply oil to compile the indicator, therefore, provides a more nuanced understanding of the overall level of strategic oil supply measures adopted by economies at different stages of development.

Unlike the method used by the IEA, this indicator only counts the days of net oil import equivalent of SPR held by the state through a public entity or oil stocks held by NOC(s). The minimum stocks private oil firms in the country are mandated to hold, and commercial stocks voluntarily maintained by private firms are excluded. Establishing and

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50 It does not mean that, however, there is a consensus among economists of its effectiveness or necessity. For example, Giacomo Luciani argues for their ineffectiveness in “Geopolitical Threats to Oil and the Functioning of the International Oil Market,” *Centre for European Policy Studies Policy Brief No. 221/November 2010*.

51 The IEA requirement is as follows: “This commitment can be met through stocks held exclusively for emergency purposes and stocks held for commercial or operational use, including stocks held at refineries, port facilities and in tankers in ports.” *Energy Supply Security 2014* (Paris: IEA, 2014), 30. For a discussion distinguishing between the two and related issues, see Giacomo Luciani and
maintaining an SPR as strategic insurance calls for considerable material capability and commitment from the state involved. Therefore, using this criterion is more parsimonious as well as more in line with the puzzle underlying this study – what compelled states to intervene directly in the economy’s oil supply at all? Of course, as detailed in Table 3.3 below, some countries have both an SPR and mandatory requirements for oil firms; some only the latter, and some neither. This gradation appears to imperfectly fit the assumption of the correlation between the type of oil stockpiling measure adopted and the state’s material capability.

<table>
<thead>
<tr>
<th>Economy</th>
<th>Number of oil import equivalent of days of SPR &amp; NOC stock in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>17(^{52})</td>
</tr>
<tr>
<td>India</td>
<td>1(^{53})</td>
</tr>
<tr>
<td>Indonesia</td>
<td>47(^{54})</td>
</tr>
<tr>
<td>Japan</td>
<td>84(^{55})</td>
</tr>
<tr>
<td>Philippines</td>
<td>0(^{56})</td>
</tr>
<tr>
<td>Singapore</td>
<td>0(^{57})</td>
</tr>
</tbody>
</table>


\(^{52}\) According to a report in the *South China Morning Post*, around 2013 and 2014, China’s SPR totalled 12.43 metric tons. Using the *BP Statistical Review of World Energy 2014 Workbook*’s 2013 import figure to make the calculation, this is the equivalent of about 16 days of oil imported. One day is needed to this figure as the amount of stocks held by NOCs is unclear. See Angela Meng, “China reveals size of strategic oil reserve for first time,” the *South China Morning Post*, 21 November 2014, accessed 28 July 2015, [http://www.scmp.com/news/china/article/1644890/china-reveals-size-strategic-oil-reserve-first-time](http://www.scmp.com/news/china/article/1644890/china-reveals-size-strategic-oil-reserve-first-time).

\(^{53}\) Various media reports point out that India only made the first crude purchase for its SPR in 2015 and so it did not have one in 2013. One day is put in here, as in the case of China, to represent the stock Indian NOCs might be holding. See “Exclusive: India makes first crude oil purchase for strategic reserve,” *Reuters*, March 30, 2015, accessed 3 August 2015, [http://in.reuters.com/article/2015/03/30/india-energy-spr-idINKBN0MO1N220150330](http://in.reuters.com/article/2015/03/30/india-energy-spr-idINKBN0MO1N220150330).


\(^{56}\) According to the IEA, since 2002, the Philippine “government requires oil refiners to maintain a minimum inventory level of 15 days, while oil importers are obliged to hold 7 days of domestic supply.” See *Energy Supply Security – Emergency Response of IEA Countries 2014*, 510. PNOC, the Philippines’ NOC, did not engage in either oil refining or importing any more in 2013. See *Philippine National Oil Company 2013 Annual Report*. Therefore, the Philippines did not maintain any SPR according to the definition of this study.

\(^{57}\) “…there is no mandatory stockholding requirement for refineries or private oil companies operating in Singapore and obligatory crude oil stockpiling was abolished in 1983. Operational stocks in refineries are estimated at around 50 days.” *Energy Supply Security – Emergency Response of IEA Countries 2014*, 510. However, since there is no NOC in Singapore in 2013, the refinery stock requirement is not counted as a strategic oil supply measure according to the definition of this study.
Table 3.3 Number of oil import equivalent of days of SPR & NOC stock in 2013

<table>
<thead>
<tr>
<th>Economy</th>
<th>Strategic Oil Supply Indicator Scores, SPR 50% weight</th>
<th>Trichotomous Strategic Oil Supply Measure (DV) Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>54.22</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>22.64</td>
<td>Medium</td>
</tr>
<tr>
<td>Indonesia</td>
<td>63.06</td>
<td>High</td>
</tr>
<tr>
<td>Japan</td>
<td>28.83</td>
<td>Medium</td>
</tr>
<tr>
<td>Philippines</td>
<td>2.50</td>
<td>Low</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.00</td>
<td>Low</td>
</tr>
<tr>
<td>S. Korea</td>
<td>38.39</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>47.00</td>
<td>High</td>
</tr>
<tr>
<td>Thailand</td>
<td>27.39</td>
<td>Medium</td>
</tr>
</tbody>
</table>

The numbers of days of SPR above are converted to percentages by using the IEA 90-day figure as 100%. Economies that have more than 90 days of SPR score over 100% as the two components of the indicator are compensatory to each other. These percentages are aggregated with the first component of the indicator with a 50% weighting to reflect its higher degree of market-conformity.  

Table 3.4 below summarises the scores of the strategic oil supply indicator of all nine case-study economies in 2013, 100 being the highest level of strategic oil supply measures adopted and 0 the lowest. They are used to calculate the corresponding trichotomous levels of strategic oil supply measures adopted by these economies, that is, their DV levels, in 2013

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59 Although there have been disputes the actual amount of SPR maintained by the Taiwanese government over the years, the 90 days of supply (basically the same as import) figure (comprising of 30 days of SPR and 60 days of NOC emergency stockpile) for 2013 is adopted in this study according to the following two sources. Rosemary A. Kelanic, “Oil Security and Conventional War – Lessons From a China-Taiwan Air Scenario,” Council on Foreign Relations Energy Report, October 2013, 7; and Huei-Chu Liao and Sih Ting Jhou, “Taiwan’s Severe Energy Security Challenges,” Brookings Institute website, September 2013, accessed February 27, 2016, http://www.brookings.edu/research/opinions/2013/09/12-taiwan-energy-security-liao.
60 In 2013, the Thai Ministry of Energy stipulated oil companies to hold 36 days of reserves. The NOC PTT controlled about 42% of the country’s crude supply (see Table A1), and Thailand’s oil self-sufficiency rate that year was about 33% (calculated with the BP Statistical Review of World Energy 2014 Workbook figures). Therefore, the number of days of government controlled days of imported oil equivalent figure is \( \frac{36 \times 0.42}{0.67} \approx 23 \).
61 See Table A1 in Appendix B for the results of aggregation with different weightings and with and without capping this component at 100% (meaning conceptualised as non-compensatory to the first component).
62 See Table A2, Appendix B for the DV levels generated with the results of different weightings and with and without capping of SPR at 100% in Appendix B. As a rule, for all weighting methods, DV scores within one standard deviation of the average (falling within 0.5 above and 0.5 below the mean DV score of the nine in the weighting method in question) are considered having a medium level. DV Scores more than 0.5 standard deviation above the average are considered having a high level and 0.5 or more below are considered having a low level.
Table 3.4  Nine-Economy Strategic Oil Supply Indicator Scores and DV Levels in 2013

2.2 Independent Variable: Oil Vulnerability Indicator

The OV indicator is made up of market and supply risks. Market risks relate to the effect of fluctuations of oil prices on national economies, such as inflation. In this project, they are measured by: (1) per capita cost of imported oil as a percentage of the economy’s per capita GDP (all in US$); and (2) oil consumption as a percentage of the total primary energy consumption. Supply risks relate to an economy’s vulnerability to oil supply disruptions. The supply-risk measures chosen are: (1) oil self-sufficiency rate; and (2) the amount of crude an economy imported as a percentage of the global crude imported of the same period. The logic for this second measure is that the higher this percentage is, the more difficult it would be to acquire the amount needed due to market liquidity issue during supply disruption situations. Equal weights are given to all four measures, which are normalised so that a higher overall score means a higher OV. Table 3.5 below summarises the 2013 OV of all nine case-study economies, 100 being the highest and 0 being the lowest. The right hand column shows their corresponding trichotomous OV, that is the IV levels in this study.

<table>
<thead>
<tr>
<th>Country</th>
<th>Oil Vulnerability</th>
<th>Trichotomous OV (IV) Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>23.18</td>
<td>Low</td>
</tr>
<tr>
<td>India</td>
<td>28.15</td>
<td>Low</td>
</tr>
<tr>
<td>Indonesia</td>
<td>21.90</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>38.80</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>33.91</td>
<td>Medium</td>
</tr>
<tr>
<td>Singapore</td>
<td>47.66</td>
<td>High</td>
</tr>
<tr>
<td>South Korea</td>
<td>36.44</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>35.36</td>
<td>Medium</td>
</tr>
<tr>
<td>Thailand</td>
<td>28.11</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 3.5 Oil Vulnerability of Nine Asian Net Importing Economies in 2013

2.3 Intervening Variable 1: Strength of Private Capital

In this section, I examine the strength of private capital by investigating the overall economic freedom in the nine case studies in 2013. The results of two “off-the-shelf” indicators are averaged to obtain the readings used in this study. The proposed model

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63 The OV index developed by Eshita Gupta, which the OV indicator in this project is simplified and adapted from, has four different measures or each of the two types of risks. See “Oil Vulnerability Index of Oil-Importing Countries,” Energy Policy 36 ((2008); 1198-1200.

64 In a natural setting, the higher the value of the first supply risk measure (oil self-sufficiency rate), the lower the OV. So this indicator will be normalised to reflect the same direction as the other three indicators: Higher values indicate higher OV.

65 For details of the calculation of countries’ OV in 2013, see Table A3, Appendix B. The same principle of how the trichotomous levels are devised described in footnote 62 also applies here and in the rest of this chapter except noted otherwise.
expects that the freer and more open an economy is at any given time, the stronger private
capital in it would be versus the state.

I use the Index of Economic Freedom (IEF) put out by the Heritage Foundation
and the Wall Street Journal and the Economic Freedom of the World (EFW) Annual Reports
released by the Fraser Institute. Both assign an annual overall score of economic freedom to
each economy surveyed. For the IEF, 10 components in the four major categories of rule of
law, limited government, regulatory efficiency, and open markets;66 the five components of
the EFW are size of government, legal system and property rights, sound money, freedom
to trade internationally, and regulation.67 Both of these indexes take into consideration a
wide range of economic and legal/regulatory status quo that reflect the power equilibria of
major stakeholders in an economy. They are, therefore, fair representations of the spirit of
the reasoning of the proposed model.

The IEF scores range from 0 to 100, 100 being “the freest” while the EFW spans
from 0 to 10. Since the scores of the other two indicators in this project range from 0 to 100
(and to facilitate comparison), the EFW scores are adjusted to the same scale. The two scores
of each economy are then averaged to gauge the overall economic freedom of the nine case
studies in this project.68 Table 3.6 below presents these scores and the trichotomous levels
of economic freedom, which are also the historical-institutional strength of private capital
of the case-study economies in 2013:

<table>
<thead>
<tr>
<th>Economy</th>
<th>IEF with 2013 Data</th>
<th>EFW with 2013 Data (adjusted)</th>
<th>Combined Average Economic Freedom Scores</th>
<th>Economic Freedom (Private Capital Strength) Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>52.5</td>
<td>64.4</td>
<td>58.45</td>
<td>Low</td>
</tr>
<tr>
<td>India</td>
<td>55.7</td>
<td>66.1</td>
<td>60.90</td>
<td>Low</td>
</tr>
<tr>
<td>Indonesia</td>
<td>58.5</td>
<td>71.7</td>
<td>65.10</td>
<td>Medium</td>
</tr>
<tr>
<td>Japan</td>
<td>72.4</td>
<td>75.0</td>
<td>73.70</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>60.1</td>
<td>70.7</td>
<td>65.40</td>
<td>Medium</td>
</tr>
<tr>
<td>Singapore</td>
<td>89.4</td>
<td>83.9</td>
<td>86.65</td>
<td>High</td>
</tr>
<tr>
<td>S. Korea</td>
<td>71.2</td>
<td>71.9</td>
<td>71.55</td>
<td>Medium</td>
</tr>
</tbody>
</table>

66 “About the Index,” accessed 14 May 2014, [http://www.heritage.org/index/about](http://www.heritage.org/index/about). On the website, it says 12 factors are taken into consideration, but for 2013 data, only 10 are used for calculation on the spreadsheet for downloading on its site, which is the source for the analysis in this study: [http://www.heritage.org/index/download](http://www.heritage.org/index/download).


Table 3.6 Economic Freedom Scores and Private Capital Strength Levels of Nine Case-Study Economies in 2013

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>73.9</td>
<td>78.4</td>
<td>76.15</td>
</tr>
<tr>
<td>Thailand</td>
<td>63.3</td>
<td>65.9</td>
<td>64.60</td>
</tr>
</tbody>
</table>

The results show that in 2013 China, India, and Thailand had a low trichotomous level of overall economic freedom among the cohort of nine Asian-Pacific economies examined in this plausibility probe. China scored the lowest in both indicators overall, but it actually only scored the lowest in three of the 10 components that make up the IFE indicator for that year. These three components are “property rights,” “investment freedom,” and “financial freedom.” India scored the second lowest on the IFE index and also ranked the bottom in three components: “business freedom,” “monetary freedom,” and “trade freedom.” Thailand did not rank the lowest in any of the IFE index components, but ranked lower than both China and India in one of the five categories investigated by the EFW indicator: “Legal System and Property Rights.”

Indonesia, the Philippines, and South Korea had a medium trichotomous level of overall economic freedom. The scores of Indonesia and South Korea were very similar, but South Korea’s was noticeably higher, meaning it enjoyed a freer economy and private capital there was stronger than in the other two medium-level countries in 2013.

Japan, Singapore, and Taiwan had a high level of overall economic freedom, with Singapore scored much higher than the other two in both indicators. In fact, Singapore received the highest scores in nine out of the 10 components of the IEF indicator. It only scored lower than Japan for “Monetary Freedom.” Japan, however, scored the lowest among all nine case studies in 2013 for “Fiscal Freedom” in the IEF indicator. This component compares individual income and corporate tax rates among economies to judge the “freedom” the public had in spending their income or revenues after fulfilling their tax obligations.

Taiwan ranked the second highest in both indicators and received higher scores in four of IEF’s 10 components than Japan: “Investment Freedom,” “Trade Freedom,” “Business Freedom,” and “Fiscal Freedom.” Singapore received the highest scores in four of the five categories investigated by the EFW indicator, but scored lower than Japan, South Korea, and Taiwan in “Sound Money,” which measures “money growth,” inflation, and freedom to own foreign currency bank accounts.

2.4 **Intervening Variable 2: Trust in Oil Markets**

This section examines decision-makers’ overall trust that oil markets can adequately provide oil security to the economy. The three major components making up the trust variable are investigated separately. They are (1) the presence/absence of NOCs and their coherence as securitising/lobbying agents, (2) the domestic context; and (3) the
external context that can be used by NOCs for securitization or lobbying. Each of these contexts impacts on decision-makers’ risk preferences and belief formation related to the trust in the domestic and the international oil markets respectively. At the end, results of trust levels generated by these three components are combined to measure the case studies’ overall trust levels in the oil markets. Figure 3.1 below summarises how these three components contribute to the overall trust level of an economy in oil markets as detailed in the next four sub-sections:

![Figure 3.1 Construction of overall trust level in oil markets](image)

2.4.1 Component 1: Securitising Agents

NOCs are hypothesised to securitise oil supply issues to justify their existence and expand their operations. The more “present” and coherent they are, therefore, the stronger their securitising strength is supposed to be. This is hypothesised to lead to a lower the level of trust if the contexts of securitising remain constant. According to this reasoning, economies with at least one “traditional” NOC are more prone to securitization and are generally assigned the lowest score for this component of trust in the market. A traditional NOC is defined as one that has been functioning reasonably well in at least one of the major sectors of the oil supply chain in that economy in the decade being studied. Economies with an untraditional “NOC” or NOCs that were incoherent or inept in securitisng receive a middling score. Economies without any form of NOCs receive the highest trust score. Table 3.7 below summarises the securitising agent scores of the nine case-study economies in 2013:

<table>
<thead>
<tr>
<th>Political Entity</th>
<th>Presence of Securitising Agent</th>
<th>Coherent NOC Securitisng Strength/Trust Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Multiple powerful traditional NOCs</td>
<td>Low/1</td>
</tr>
<tr>
<td>India</td>
<td>Multiple powerful traditional NOCs</td>
<td>Low/1</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Single powerful traditional NOC</td>
<td>Low/1</td>
</tr>
<tr>
<td>Japan</td>
<td>Non-traditional NOC</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Philippines</td>
<td>Single Weak traditional NOC</td>
<td>Medium/2</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Singapore</td>
<td>No NOC</td>
<td>High/3</td>
</tr>
<tr>
<td>South Korea</td>
<td>Single powerful NOC</td>
<td>Low/1</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Single powerful NOC</td>
<td>Low/1</td>
</tr>
<tr>
<td>Thailand</td>
<td>Single powerful NOC</td>
<td>Low/1</td>
</tr>
</tbody>
</table>

Table 3.7 NOC Securitising Coherence-Strength and corresponding Trust Core of Nine Case-Study Economies in 2013

Most of the contents of the above table should be self-explanatory with the discussions detailing these economies’ NOCs or lack thereof in Section 2.1.1 above. Japan is assigned the middling score because it had not had a traditional NOC since 2004. While the Philippines had a traditional NOC PNOC in 2013, it did not produce or procure any crude oil.

Two thirds or six of the nine case studies received the low trust score for this component because they had at least one powerful NOC as of 2013. Japan and the Philippines received the middle score because of the reason explained in the last paragraph. Singapore was the only one that received a high trust score because it no longer had an NOC in the years leading to 2013.

2.4.2 Component 2: Domestic Securitising Context

In this section, I measure the evenness and level of economic development of the case studies. This is justified because these two aspects together form a major context NOCs could use to securitise or lobby their importance in the domestic oil market. Without using the terminology, NOCs could co-opt the economic concept of merit goods. According to this concept, government provision of these goods, such as primary education, generates positive externalities to the whole society. The more unequal and poorly developed an economy, the more persuasive this argument would be. This is because positive externalities are much needed when the basic oil supply needs of a large segment of the population might not be adequately served by private oil firms due to lack of profitability. NOCs could easily seize the salience of the context to perpetuate their existence. NOC securitisation would be especially plausible in societies more used to state intervention in other aspects of public lives and more open to non-neoliberalist economic measures.

The percentage of the polity’s urban population is used as a proxy for the geographical evenness of development. A larger urban population usually indicates a more even economic development across the country. While there are urban slums with great poverty, the concentration of people itself would facilitate ready markets for private firms. This means that it would be easier for the masses to access the oil they need without

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69 See footnotes 47 and 48.
70 See footnote 21.
71 See footnote 8 and 9 for references of the concept of merit goods.
government intervention. Per capita gross domestic products (GDP) are measured to gauge the level of economic development. The scores polities receive for these two aspects are averaged to generate an overall domestic context trust score.

The vulnerability-interaction model predicts that an objective domestic environment of relatively even and high level of economic development would make NOCs’ attempts to trump up their importance in ensuring supply oil to the poor and/or rural population more difficult. This would in turn generate a higher trust level in the functioning of a free domestic oil market and a correspondingly high trust score. Conversely, polities with a large rural population and/or a low GDP receive a low trust score due to the relevance for NOC securitising. Table 3.8 below summarises the domestic securitising conditions and resulting trust scores of the nine case studies in 2013. A higher overall domestic context trust score denotes a higher level of trust in the functioning of a free domestic oil market.

<table>
<thead>
<tr>
<th>Polity</th>
<th>Percentage of Urban Population 2013</th>
<th>Level of Urbanization/ resulting trust score 72</th>
<th>Per Capita GDP (PPP) 2013 in US$ 74</th>
<th>Level of Economic Development/ resulting trust score</th>
<th>Overall Domestic Context Trust Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>53</td>
<td>Medium/2</td>
<td>12,211</td>
<td>Low/1</td>
<td>1.5</td>
</tr>
<tr>
<td>India</td>
<td>32</td>
<td>Low/1</td>
<td>5,268</td>
<td>Low/1</td>
<td>1.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>52</td>
<td>Low/1</td>
<td>10,011</td>
<td>Low/1</td>
<td>1.0</td>
</tr>
<tr>
<td>Japan</td>
<td>92</td>
<td>High/3</td>
<td>36,618</td>
<td>Medium/2</td>
<td>2.5</td>
</tr>
<tr>
<td>Philippines</td>
<td>45</td>
<td>Low/1</td>
<td>6,588</td>
<td>Low/1</td>
<td>1.0</td>
</tr>
<tr>
<td>Singapore</td>
<td>100</td>
<td>High/3</td>
<td>80,780</td>
<td>High/3</td>
<td>3.0</td>
</tr>
<tr>
<td>South Korea</td>
<td>82</td>
<td>High/3</td>
<td>32,664</td>
<td>Medium/2</td>
<td>2.5</td>
</tr>
<tr>
<td>Taiwan</td>
<td>70</td>
<td>Medium/2</td>
<td>43,600</td>
<td>High/3</td>
<td>2.5</td>
</tr>
<tr>
<td>Thailand</td>
<td>48</td>
<td>Low/1</td>
<td>15,437</td>
<td>Low/1</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 3.8 Urban Population Percentage, Per Capita GDP, and corresponding trust scores of Nine Case-Study Economies in 2013

The results show that India, Indonesia, the Philippines, and Thailand had the most salient overall domestic context for NOCs to securitise their role in their respective domestic

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73 The levels of urbanization, economic development, and overall domestic context trust level are compiled by using the same method of averaging and standardising the results of all case study countries as specified in footnote 62 above. The same is true in all comparative levels thereafter unless noted otherwise.

oil markets. These four economies, therefore, received the lowest overall domestic context trust score. China was a little more urbanised and received a slightly higher overall domestic context trust score than those four. Japan, South Korea, and Taiwan all received the same overall domestic score of 2.5 out of the highest possible of 3, signifying they reached a rather high level and even economic development. Singapore had the highest domestic context trust score because its economic development was at such a high level that securitising about the untrustworthiness of the domestic oil markets would be difficult.

2.4.3 Component 3: External Securitising Context

This sub-section assesses the overall relations between the case-study polities and the United States in 2013. The vulnerability-interaction model hypothesises that these relations form the major external context that NOCs and other interested parties could use to securitise to lower decision-makers’ trust in solely relying on the international markets to fuel their respective economies. The United States has been a hegemonic power and dominant player in most international institutions for about 70 years. The most important international oil exchanges (markets) and oil price reporting agencies, which have been an integral part of the functioning of the current oil-pricing regime, are American firms. In addition, it is still the only country that has overwhelming naval power to impede the physical flow of maritime oil supply to the Asia Pacific. If these facts are securitised to be


The Dubai Mercantile Exchange (DME), where Oman crude oil futures contract, a major benchmark for crude oil price in Asia, is owned and operated by Dubai and Oman companies. The DME, however, has a “strategic partnership” with the CME to extend its clearing services. This likely provides further “proof” of the great reach of American power and doubts of these exchanges’ fairness to U.S. adversaries. See “CME Group Strategic Partnership with Dubai Mercantile Exchange,” DME website, accessed 27 December 2016, http://www.cmegroup.com/international/partnership-resources/dme-resources.html.

Of the two most important oil reporting agencies, one is U.S. (Platts) and the other is a U.K.-based company (Argus Media). For more about the roles played by these agencies and associated with them in international oil transactions, see “Oil Price Reporting Agencies – Report by IEA, IEF, OPEC and IOSCO to G20 Finance Ministers, October 2011.” Website of The International Organization of Securities Commissions (IOSCO). Accessed 10 October 2016, https://www.iosco.org/library/pubdocs/pdf/IOSCOPD364.pdf.

76 Hughes and Long, “Is There an Oil Weapon?” 173 – 180. China’s naval capability has improved dramatically since the 1990s and is described as being able to “conduct high intensity operations” in its immediate periphery and “carry out low intensity operations around the world” as of 2013. China may possess the naval power to effectively counter any interdiction of maritime oil shipment to China in the future, but such capability has not been realised yet. See Craig Murray, Andrew Berglund, and Kimberly Hsu, “China’s Naval Modernization and Implications for the United States,” U.S.-China Economic and Security Review Commission Staff Research Backgrounder August 26, 2013. Accessed 20 February 2017,
viewed through a zero-sum aggressive economic nationalist lens, they would impact on decision-makers’ risk preferences and belief formation on the trustworthiness of the international oil markets. This would be especially pertinent for those with negative relations with the United States.

The case-study polity’s relations with the United States are categorised in three descending levels of “closeness” as: formal or de facto allies, friendly-neutral, and neutral-conflictual in this study. The “closer” or better the relationship was, the higher the trust in the international oil markets.

China is coded the third category. There has been cooperation between China and the United States in such policy areas as reduction in carbon emission and diplomatic pressure on the North Korean regime on anti-nuclear proliferation in the last two decades. The repeated incidents of military tension between China and the United States or its allies during the same period, however, were much more prominent. Furthermore, the prospect of resolving a number of contentious issues appears dimmer over the years, such as the status of Taiwan and claims to sovereignty of the Diaoyu/Senkaku Islands and other island reefs in the South China Sea. Therefore, the relationship between China and the United States is classified as the least close of the three categories in this preliminary study.

India is only coded as having an overall friendly-neutral relationship with the United States between 1994 and 2013. While it signed the “Agreed Minute on Defence Relations” in 1995 and the “New Framework for the U.S.-India Defence Relationship” in 2005, these agreements indicate friendly relationships in the military and other domains, but are qualitatively different than actual mutual defence treaties some Asian countries have with the United States. The latter entail concrete obligations and benefits, not just voluntary defence or strategic cooperation.

Indonesia and Singapore are also coded as friendly-neutral. Like India, the United States considers these two countries “strategic partners,” but not “major non-NATO allies (MNNAs).” U.S. relationship with Indonesia has “improved dramatically” since its democratic developments in the early 2000s, while the “working defence relationship” with


Examples of such incidents during the period studied in this thesis include the Taiwan Strait Crises of 1995-96, the EP-3 incident in 2001, and quasi-military forces of China and Japan, Philippines confronting and harassing each other in East China Sea since early 2011.


Singapore was “formalised” in 2005. Both are put in the middling friendly-neutral category. Of course, this does not mean that India, Indonesia, and Singapore had exactly the same quality or closeness of relationship with the United States in the decade leading to 2013. It just means that their relationships belong to the same trichotomous level.

Japan, the Philippines, and South Korea are both MNNAs and formal allies and enjoy the closest type of relationship with the United States in the Asia Pacific. The formal defence treaties between the United States and Japan and with the Philippines were both first signed in 1951, and the one with South Korea was signed in 1953. The relations between the Philippines and the United States seem to deteriorate rapidly after the President Duterte came to power in the Philippines in 2016, but that is beyond the scope of this study. Again, there was obvious difference in the quality of the relations these three countries had with the United State even before 2013, but it was small enough to group them within the same trichotomous level.

Thailand, too, is both a MNNA and a formal ally. Its relations with the United States, however, has drifted. This has become obvious even to casual observers after Thailand’s latest coup in May 2014, but the decline of the relationship appears to have started gradually as far back as the final years of the Cold War. There were improvements during periods of civilian rule, but this study categorises Thailand as only having a friendly-neutral relationship with the United States as of 2013.

Taiwan is a special case. The United States is not a formal ally or has even maintained an official diplomatic relationship with Taiwan since 1979. In the same year, however, the Taiwan Relations Act was enacted, which assures no non-peaceful resolution of the future of Taiwan, and U.S. arms sales and defence services to Taiwan. In addition, the U.S. Code of Federal Regulations as is currently written, states that “Taiwan shall be treated as though

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80 Vaughn, 24.
81 Vaughn, 15.
82 Ibid.
it were designated a major non-NATO ally.” Therefore, it too is put in the first category of relationship with the United States. Table 3.9 below summarises the relations between the case-study polities and the United States, their salience of the external securitising context, as well as the resulting trust level scores throughout the period studied:

<table>
<thead>
<tr>
<th>Polity</th>
<th>Relations with the United States 1994-2013</th>
<th>External Securitising Context Salience/Trust Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>neutral-conflictual</td>
<td>High/1</td>
</tr>
<tr>
<td>India</td>
<td>friendly-neutral</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>friendly-neutral</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Japan</td>
<td>formal ally equivalent</td>
<td>Low/3</td>
</tr>
<tr>
<td>Philippines</td>
<td>formal ally equivalent</td>
<td>Low/3</td>
</tr>
<tr>
<td>Singapore</td>
<td>friendly-neutral</td>
<td>Medium/2</td>
</tr>
<tr>
<td>South Korea</td>
<td>formal ally equivalent</td>
<td>Low/3</td>
</tr>
<tr>
<td>Taiwan</td>
<td>formal ally equivalent</td>
<td>Low/3</td>
</tr>
<tr>
<td>Thailand</td>
<td>friendly-neutral</td>
<td>Medium/2</td>
</tr>
</tbody>
</table>

Table 3.9 Relationships with the United States, Salience of External Securitising Context, Trust Level Scores of Nine Case-Study Polities 1994-2013

2.4.4 Overall Trust in Oil Markets

Decision-makers’ overall levels of trust in oil markets are calculated by adding the three sets of trust scores measured above. Table 3.10 below summarises all these results, with each component weighted equally. A higher trust score denotes a higher level of overall trust, with “3” being the lowest and “9” the highest possible overall score respectively.

<table>
<thead>
<tr>
<th>Economy</th>
<th>Securitising Agent Coherence Trust Score</th>
<th>Domestic Securitising Context Trust Score</th>
<th>External Securitising Context Score</th>
<th>Overall Trust Score</th>
<th>Overall Trust Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>3.5</td>
<td>Low</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>1.0</td>
<td>2</td>
<td>4.0</td>
<td>Low</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1</td>
<td>1.0</td>
<td>2</td>
<td>4.0</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
<td>7.5</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>2</td>
<td>1.0</td>
<td>3</td>
<td>6.0</td>
<td>Medium</td>
</tr>
<tr>
<td>Singapore</td>
<td>3</td>
<td>3.0</td>
<td>2</td>
<td>8.0</td>
<td>High</td>
</tr>
<tr>
<td>S. Korea</td>
<td>1</td>
<td>2.5</td>
<td>3</td>
<td>6.5</td>
<td>High</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1</td>
<td>2.5</td>
<td>3</td>
<td>6.5</td>
<td>High</td>
</tr>
<tr>
<td>Thailand</td>
<td>1</td>
<td>1.0</td>
<td>2</td>
<td>4.0</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 3.10 Numeric Representation and Level of Trust in Oil Markets in years leading to 2013

87 In spite of the fact that Vaughn’s CRF report only describes Taiwan as having a “key strategic relationship” with the United States like Singapore, India, and Indonesia.
China, India, Indonesia, and Thailand had the lowest trichotomous overall trust in the oil markets in 2013 among the nine case-study economies. Among them, China had the lowest trust score. The Philippines had a medium level of trust and Japan, Singapore, South Korea, and Taiwan had a high level of trust, with Singapore again scoring the highest. The vulnerability-interaction model hypothesises that decision-makers’ level of trust in the oil markets is the central ITV that binds the IV and the other ITVs together. Once a trust level is formed, however, the corresponding level of strategic oil supply measures can only be materialised if the polity possesses the requisite implementation capability. This brings us to the last ITV of implementation capability.

2.5 Implementation Capability

This section evaluates the case-study states’ capabilities to implement strategic oil supply measures in 2013. To do this, I examine three components that make up the case studies’ financial capabilities and one proxy presenting their diplomatic capability. Finally, the degree of centralization of central government authority to effectively make use of the implementation capability is factored into consideration. Each of these components are detailed in the following three sub-sections. Figure 3.2 below provides a schematic representation of the construction of the overall trichotomous implementation capability level of each case-study economy.

Figure 3.2 Construction of Overall Implementation Level

88 In the current globalised and relatively liberalised era, this study simplifies this analytical task by not investigating polities’ technical capabilities separately as countries with enough financial capabilities would be able to acquire the technology needed through means such as hiring foreign experts or setting up joint ventures with foreign companies which possess the technology.
2.5.1 Financial Capability

States need financial capability to implement both market-displacing and market-conforming strategic oil supply measures. Capital is needed to set up NOCs; overseas equity oil investments are capital-intensive and risky; constructing and filling up SPRs requires cash or cash equivalents. So how can states’ financial capability to implement these measures be judged? The per capita GDP examined earlier point more to the level of economic development of the polity than the actual size of financial resources a state can mobilise or the ease with which resources can be put to use at any given time. Since almost all international oil transactions during the period studied are denominated in U.S. dollars, the size of states’ foreign exchange reserves, especially those in U.S. dollars, would be a good way to gauge states’ financial capability to implement strategic oil supply measures in the short to medium terms.89

Table 3.11 below lists the foreign exchange reserves of the nine case-study economies and their trichotomous levels. The higher the level of reserves an economy held in 2013, the higher the corresponding implementation score it receives.90

<table>
<thead>
<tr>
<th>Economy</th>
<th>Foreign Exchange Reserves in 201389</th>
<th>Trichotomous Level/Score</th>
<th>Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$3,880,000,000,000</td>
<td>High/3</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>$298,092,000,000</td>
<td>Medium/2</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>$99,387,000,000</td>
<td>Low/1</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>$1,267,000,000,000</td>
<td>Medium/2</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>$83,182,000,000</td>
<td>Low/1</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>$277,798,000,000</td>
<td>Medium/2</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>$345,694,000,000</td>
<td>Medium/2</td>
<td></td>
</tr>
</tbody>
</table>

89 China has settled oil transactions with Iran in renminbi before 2013, and both India and China acquired oil from the Soviet Union and Eastern European countries that were not paid in U.S. dollars during the Cold War. However, the overwhelming majority of oil supplied to the case-study economies during the period studied, including 2013, was denominated in U.S. dollars. See “China Buying Oil from Iran with Yuan,” BBC website, 8 May 2012, accessed 10 February 2016, [http://www.bbc.com/news/business-17988142](http://www.bbc.com/news/business-17988142). Also see Alastair Crooke, “The Non-Dollar Trading Is Killing the Petrodollar – And the Foundation of U.S.-Saudi Policy in the Middle East,” The Huffington Post, 2 December 2014, accessed 10 February, [http://www.huffingtonpost.com/alastair-crooke/petrodollar-us-saudi-policy_b_6245914.html](http://www.huffingtonpost.com/alastair-crooke/petrodollar-us-saudi-policy_b_6245914.html).

90 “Hoarding” of foreign exchange reserves enables states to provide low-interest loans to NOCs or to implement other strategic oil supply measures effectively in the short to medium terms, which is the time horizon of this study and likely that of most decision-makers. Studies suggest that, however, such behaviour may weaken the overall financial sector of the economy in the long run. It may also engender “competitive hoarding” and lowering of exchange rates of economies, especially those with similar export markets. See Jaewoo Lee and Joshua Aizenman, Financial versus Monetary Mercantilism: Long-run View of Large International Reserves Hoarding IMF Working Papers 2006/280 (International Monetary Fund December 2006).

<table>
<thead>
<tr>
<th>Economy</th>
<th>Nominal GDP in U.S. Dollars in 2013</th>
<th>Trichotomous GPD Level/Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$9,490,602,600,148</td>
<td>High/3</td>
</tr>
<tr>
<td>India</td>
<td>$1,861,801,615,478</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>$910,478,729,099</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Japan</td>
<td>$4,919,563,108,373</td>
<td>High/2</td>
</tr>
<tr>
<td>Philippines</td>
<td>$271,927,428,133</td>
<td>Low/1</td>
</tr>
<tr>
<td>Singapore</td>
<td>$302,245,904,260</td>
<td>Low/1</td>
</tr>
<tr>
<td>South Korea</td>
<td>$1,305,604,981,272</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Taiwan</td>
<td>$933,031,437,500</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Thailand</td>
<td>$420,166,569,029</td>
<td>Low/1</td>
</tr>
</tbody>
</table>

Table 3.12 Nine Case-Study Economies’ Nominal GDP in 2013

Apart from internal revenue and reserves, an economy can also issue sovereign bonds to raise funds. The absolute amount as well as the ease and cost a national government can borrow are contingent upon both the size of its economy as well as its credit worthiness, which is generated by taking into consideration a whole host of factors incorporated by a number of credit rating companies. This table below summarises the overall credit worthiness of the case-study economies by averaging the ratings given to them by three major credit rating companies.

92 Printing more money is likely to devalue the currency and discount the actual financial capability of the country down the road anyway.
major companies, S&P, Moody’s, and Fitch." These ratings are then translated numerically according to the International Monetary Fund (IMF) 24-point “transposition scale,” with “1” denoting the most credit-worthy. Therefore, the lower the IMF score an economy receives, the higher its trichotomous overall credit worthiness level and score will be.

<table>
<thead>
<tr>
<th>Economy</th>
<th>S&amp;P Rating</th>
<th>Moody’s rating</th>
<th>Fitch Rating</th>
<th>IMF Scale Score</th>
<th>Trichotomous Overall Credit Worthiness Level/Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>AA-</td>
<td>Aa3</td>
<td>A+</td>
<td>4.3</td>
<td>High/3</td>
</tr>
<tr>
<td>India</td>
<td>BBB-</td>
<td>Baa3</td>
<td>BBB-</td>
<td>10.0</td>
<td>Low/1</td>
</tr>
<tr>
<td>Indonesia</td>
<td>BB+</td>
<td>Baa3</td>
<td>BBB-</td>
<td>10.3</td>
<td>Low/1</td>
</tr>
<tr>
<td>Japan</td>
<td>AA-</td>
<td>Aa3</td>
<td>A+</td>
<td>4.3</td>
<td>High/3</td>
</tr>
<tr>
<td>Philippines</td>
<td>BB+</td>
<td>Ba1</td>
<td>BB+</td>
<td>11.0</td>
<td>Low/1</td>
</tr>
<tr>
<td>Singapore</td>
<td>AAA</td>
<td>Aaa</td>
<td>AAA</td>
<td>1.0</td>
<td>High/3</td>
</tr>
<tr>
<td>S. Korea</td>
<td>A+</td>
<td>Aa3</td>
<td></td>
<td>4.5</td>
<td>Medium/2</td>
</tr>
<tr>
<td>Taiwan</td>
<td>AA-</td>
<td>Aa3</td>
<td>A+</td>
<td>4.3</td>
<td>High/3</td>
</tr>
<tr>
<td>Thailand</td>
<td>BBB+</td>
<td>Baa1</td>
<td>BBB</td>
<td>8.3</td>
<td>Medium/2</td>
</tr>
</tbody>
</table>

Table 3.13 Nine Case-Study Economies’ Credit-Worthiness as of 2013

The overall financial capabilities of economies are ascertained by combining their internal financial capability and the capability to obtain funds externally. Similar to the method used to obtain the overall trust in the oil markets’ capability to adequately supply oil to these same polity, the three components of the financial capability scores shown in Tables 3.11, 12, and 13 above are added up to create the overall financial capability scores, with “9” being the highest and “3” the lowest possible score respectively. Table 3.14 below summarises these scores the nine case-study economies receive and their respective trichotomous overall financial capability levels in 2013:

<table>
<thead>
<tr>
<th>Economy</th>
<th>Forex Reserve</th>
<th>Nominal GDP</th>
<th>Credit Worthiness</th>
<th>Overall Financial Capability Score</th>
<th>Trichotomous Overall Financial Capability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>High</td>
</tr>
</tbody>
</table>


96 Bhati, 8. The table on this page gives a “translation” of the different letter grades with the – or + signs to 24 whole number grades. I have averaged out the grades if they are not totally equivalent to each other according to this IMF formulation, and hence resulting in some countries having a non-whole number grade.

97 While the same averaging and standardising procedure is followed to generate these comparative levels, the medium level covers those 0.6 instead of 0.5 standardise deviation above and below the average IMF scale score. If this minor adjustment is not made, none of the nine economies would be considered having a medium level of credit worthiness.
<table>
<thead>
<tr>
<th>Country</th>
<th>Diplomatic Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>Low</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>Low</td>
</tr>
<tr>
<td>Singapore</td>
<td>Medium</td>
</tr>
<tr>
<td>S. Korea</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>High</td>
</tr>
<tr>
<td>Thailand</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 3.14 Nine Case-Study Economies’ Overall Financial Capabilities in 2013

2.5.2 Diplomatic Capability

Diplomatic capabilities refer to the ability to achieve diplomatic or political objectives in major international or regional fora either by supporting or withholding support to resolutions or other collective decisions. The United Nations (UN) Security Council “rests at the heart of the international architecture.” It wields relatively great diplomatic power as it can impose sanctions, authorise the use of force to maintain or restore peace, make recommendation on the appointment of the UN Secretary-General, and elect judges of the International Court of Justice. There are other diplomatic fora involving political entities in the Asia-Pacific, such as the Asia Pacific Economic Cooperation. None of them, however, covers the majority of exporting countries that supply oil to the region, which are supposedly the target recipients of diplomatic capability.

UN Security Council (UNSC) membership is, therefore, used as a proxy of diplomatic capability. Countries which are permanent members of the UNSC stay on the council for the indefinite future and possess what is termed the “double the veto” power. Therefore, they are deemed as possessing the greatest diplomatic capability. Countries that are non-permanent or rotating UNSC members only serve a term of two years at a time and they do not possess any veto power by themselves. During their tenure, however, non-permanent member countries do possess more power over general members of the UN. Political entities which are not UN general members have the least diplomatic clout. Table

---

98 Some possible cases of such use of diplomatic capability in connection with Sudan and Iran that has been examined. Regardless the merit of individual claims, if an oil importing country is in possession of such diplomatic capability, there is always the possibility that it can use it accordingly upon consideration of the costs and benefits of its application.
3.15 below summarises the results for the nine case study polities in 2013, “4” denoting the greatest and “1” the least capability:

<table>
<thead>
<tr>
<th>Polity</th>
<th>UNSC Membership in 2013</th>
<th>Diplomatic Capability Score</th>
<th>Trichotomous Diplomatic Capability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Permanent</td>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>Non-Permanent</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>Indonesia</td>
<td>None</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>Japan</td>
<td>None</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>Philippines</td>
<td>None</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>Singapore</td>
<td>None</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>S. Korea</td>
<td>Non-Permanent</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Non-UN Member</td>
<td>1</td>
<td>Low</td>
</tr>
<tr>
<td>Thailand</td>
<td>None</td>
<td>2</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 3.15 Nine Case-Study Polities’ Diplomatic Capability in 2013

2.5.3 Overall Implementation Capability

To ascertain the case studies’ overall capability to implement oil supply capabilities as of 2013, this sub-section first combines their overall financial capability scores with their diplomatic capability scores to generate the overall implementation scores. Table 3.16 below recaps these scores and shows each case study’s sum as its overall implementation capability score in 2013 and its corresponding overall implementation capability level, with “13” being the highest and “4” the lowest possible score respectively:

<table>
<thead>
<tr>
<th>Polity</th>
<th>Overall Financial Capability Score</th>
<th>Diplomatic Capability Score</th>
<th>Overall Implementation Capability Score</th>
<th>Overall Implementation Capability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>9</td>
<td>4</td>
<td>13</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>Medium</td>
</tr>
<tr>
<td>Indonesia</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>Low</td>
</tr>
<tr>
<td>Singapore</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>Medium</td>
</tr>
<tr>
<td>S. Korea</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>Medium</td>
</tr>
<tr>
<td>Thailand</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>Medium</td>
</tr>
</tbody>
</table>

103 It is not one of the five permanent members (the United States, Russia, Britain, France, and China), but it is a non-permanent member in 2011-12. The years are very close to 2013 and would have an impact on its oil diplomacy immediately preceding 2013. See “Members of the Security Council in 2013,” UN website, accessed 15 February 2016, [http://www.un.org/en/sc/members/elected.asp](http://www.un.org/en/sc/members/elected.asp).

104 Indonesia and the five “none” cases were either permanent nor non-permanent members around 2013. Ibid.

105 Ibid.

106 Taiwan or the Republic of China has not been a UN member since 1971. For a history of its UN membership vis-à-vis that of China (People’s Republic) and its diplomatic consequences, see Sigrid Winkler, “Taiwan’s UN Dilemma: To Be or Not To Be,” Brookings Institute website, accessed 15 February 2016, [http://www.brookings.edu/research/opinions/2012/06/20-taiwan-un-winkler](http://www.brookings.edu/research/opinions/2012/06/20-taiwan-un-winkler).
Table 3.16  Nine Case-Study Polities’ Overall Implementation Capability in 2013

Finally, factoring in the concept of the centralization of authority to effectively mobilise the material capabilities an economy possesses, the nine case studies are categorised according to their regime types. The three designations of “autocracy,” “democracy,” or “anocracy” these polities received for 2013 are translated into trichotomous scores. I argue that it is generally easier and faster for central-level decision-makers in autocracies to implement executive decisions as they do not have to be directly or formally accountable to other branches of government, such as an elected legislature or an independent judiciary. Autocracies, therefore, receive the highest score that denotes the highest centralization of authority, “3.” On the other hand, due to the supposedly unstable and inefficient nature of anocracies, the opposite is true for them and they receive a centralization score of “1.” Democracies fall between the two. This reasoning only suggests the greater short-term capability of autocracies to execute strategic oil supply measures. It does not imply that autocracies are inherently stronger or more stable. Table 3.17 below shows the overall implementation scores after the degree of centralization of authority is factored in:

<table>
<thead>
<tr>
<th>Polity</th>
<th>Overall Implementation Capability Score</th>
<th>Regime Type</th>
<th>Centralization Score</th>
<th>Overall Implementation Capability Score with degree of centralization</th>
<th>Trichotomous Implementation Capability Level with degree of centralization</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>13</td>
<td>Autocracy</td>
<td>3</td>
<td>16</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>8</td>
<td>Democracy</td>
<td>2</td>
<td>10</td>
<td>Medium</td>
</tr>
</tbody>
</table>

107 On the “Polity IV Individual Country Regime Trends, 1946-2013” webpage, polities are divided into seven regime types, but only four of them were assigned to the case-study polities in this project. They are: Full Democracy, Democracy, Closed Anocracy, and Autocracy. See http://www.systemicpeace.org/polity/polity4x.htm, accessed 13 February 2016. However, on the “About Polity” webpage, the Polity score regime types are categorised as “autocracies,” “anocracies,” and “democracies” only. This fits well with the trichotomous categorization of variables in this project and so are adopted. Basically, the categories of full democracy and democracy are merged. See http://www.systemicpeace.org/polityproject.html, accessed 13 February 2016.

108 This argument does not contradict Kong and Andrews-Speed et al.’s findings that there are multiple sources of energy policy decision making bodies in China. It only argues that if all things remain equal, an autocracy like China should be able to execute its capability more efficiently than a democracy like India or Japan.

109 For a discussion of the characteristics and characterization of these regime types by the Polity IV project, including anocracies, see Monty G. Marshall and Benjamin R. Cole, Global Report 2014 – Conflict, Governance, and State Fragility (Vienna, VA: Center for Systemic Peace, 2014), 20-22.

110 Among the case-study polities, Singapore is the only one designated as an anocracy in 2013 by the Polity IV project. This appears to be contradictory to the common impression of the very high efficiency of the Singaporean government. Singapore is apparently an anomaly among anocracies in other regards as well. It is also the only non-democracy that receives a “fragility score” of 2 or lower, which speaks for its relative stability. Ibid., 49-51.

A comparison between the far right columns of Tables 3.16 and 3.17 shows that the trichotomous implementation capability levels of the nine case-study polities remain the same with or without incorporating the centralization scores. This does not mean that the degree of centralization of authority is superfluous to states’ capabilities to implement strategic oil supply measures. The distribution of the attributes and capabilities of these nine case-study economies in 2013 just happens to render these comparative trichotomous levels the same with or without factoring in the degree of centralization of authority of their national governments.112

China had the highest financial as well as diplomatic capabilities in 2013 among the nine case-study economies. It was also the only one coded as an autocracy and so received the highest centralization score. Therefore, it had a high overall implementation capability level and its overall implementation score was considerably higher than Japan’s, the only other case study that reached a trichotomously high implementation capability.

India, Singapore, South Korea, Taiwan, and Thailand all had a medium implementation level. South Korea had the highest overall implementation score among these five, with India and Taiwan following closely behind. Taiwan’s unusually low diplomatic capability score and Singapore’s relatively small economy in absolute terms prevented them from scoring higher, but even adding one more point to their respective overall scores would not have changed their trichotomous capability level. Indonesia and the Philippines had a low implementation capability level, mainly due to their unimpressive financial capabilities.

The results of this ITV used to examine the validity of the H1 to H4 in this plausibility probe, as shown on Table 3.17, appear to match the general expectation of the actual capabilities of these polities as of 2013. China was the most powerful, followed by

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112 Singapore’s trichotomous overall implementation capability level with the degree of centralization factored in would remain unchanged as medium among these same case-study polities, even if its centralization score is changed to that representing either democracy or autocracy. If Singapore is coded as either an autocracy or a democracy, however, Thailand’s overall implementation capability would be downgraded to “low,” but the levels of all the other polities would remain the same. See the calculation of all three scenarios in Table A4, Appendix B.
Japan, South Korea, and then India. The Philippines was the least capable among this cohort, followed by Indonesia. Evidence more specific to the implementation capability of strategic oil supply measures is analysed in cases chosen for in-depth investigations in Chapters Four and Five.

3. Preliminary Results of Cross-Case Study

The results of the plausibility probe in the previous section show that the overall validity of H1 and H2 with 2013 data reaches 67%. These preliminary results show good support to the vulnerability-interaction. Section 5 as well as the concluding section of this chapter more comprehensively review the overall validity of the model and compares it to theories adopting the Realist/geopolitical perspective.

Table 3.18 below summarises the trichotomous levels of all the variables, that is DV, IV, and all three ITVs of the nine case-study economies in 2013:

<table>
<thead>
<tr>
<th>Economy</th>
<th>DV Level</th>
<th>OV (IV) Level</th>
<th>Strength of Private Capital</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Indonesia</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Singapore</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>S. Korea</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Thailand</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 3.18 Trichotomous Levels of All Variables for Nine Case-Study Economies in 2013

Among the 36 paired comparisons generated from the nine case-study economies, one pair, India and Thailand (bolded in Table 3.18), has the parameters of H1, that is, all four explanatory variables having the same level. Their DV levels are also the same, which is congruent with the expectation of H1.113

The parameters of H2 call for different levels in one of the four explanatory variables only. Five pairs of economies emerge with this condition.114 Three out of these five pairs, that is 60% of the cases, are congruent with the expectation of H2: the only explanatory variable that had a substantive difference in level explained the substantive difference in the pair’s DV levels. Table 3.19 below summarises the data for these five pairs of economies:

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113 For a complete list of all 36 pairs comparisons and the differences in their explanatory factors and DV levels, see Table A5 in Appendix B.

114 Ibid.
<table>
<thead>
<tr>
<th>Economies</th>
<th>Difference in DV</th>
<th>Congruent with model?</th>
</tr>
</thead>
<tbody>
<tr>
<td>China and India</td>
<td>One Level</td>
<td>Yes</td>
</tr>
<tr>
<td>China and Thailand</td>
<td>One Level</td>
<td>Yes</td>
</tr>
<tr>
<td>Japan and Singapore</td>
<td>One Level</td>
<td>Yes</td>
</tr>
<tr>
<td>Singapore and Taiwan</td>
<td>Two Levels</td>
<td>No</td>
</tr>
<tr>
<td>South Korea and Taiwan</td>
<td>One Level</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 3.19 Economies Having Different Levels in One Explanatory Factor Only in 2013

The only difference in the four explanatory variables between China and India is that China has a higher implementation capability. As predicted by H2, China indeed adopted a higher level of strategic oil supply measures than India in 2013. The same is true for the pair of China and Thailand. The only difference in the four explanatory variables between Japan and Singapore is that Japan had a higher implementation capability. Congruent with the expectation of H2, Japan adopted a higher level of strategic oil supply measures than Singapore in 2013. Taiwan had a lower OV level than Singapore as of 2013, but it adopted two levels higher of strategic supply measures. Therefore, this pair of cases are incongruent with the expectation of the reasoning of the vulnerability-interaction model.

In the cases of Taiwan and South Korea, the freer Taiwanese economy did not lead it to adopt to a lower level of strategic oil supply measures than South Korea did. The results of both pairs suggest that Taiwan is the source of incongruity to the model. It appears to have an unusually high DV level relative to the levels of its explanatory factors among the case-study economies.

The overall congruence rate of the cross-case dimension of the first layer of the vulnerability-interaction model reaches 67%. A total of six pairs of economies emerge with the parameters stipulated in H1 or H2. One pair, India and Thailand, has all variables at the same level and so is congruent with the expectation of H1. Five pairs fulfill the conditions of H2. Three of the five pairs, or 60% of the cases, are congruent with the expectation by H2.

4. Cross-Temporal Comparisons of H1 and H2

The first layer of the vulnerability-interaction model explains changes in outcomes both across economies and over time. Section 2 of this chapter presents a preliminary cross-case study of H1 and H2. This section focuses on the cross-temporal dimension of these two hypotheses. Data for year 2003 is chosen for comparison with those in 2013. Oil prices were relatively low in the decade immediately preceding 2003. They trended upward in the next decade with only a slight dip during the great financial crisis of 2009 and 2010. Many strategic oil supply measures, including the two used to make up the DV value in this study,
have relative long time lags in implementation. Therefore, comparing the values of the variables in 2003 with those in 2013 offers an opportunity to observe the extent oil prices, factored in the OV calculations of economies, may impact on policymakers’ decision to implement strategic oil supply measures.

Table 3.20 below summarises changes in the values as well as levels of all the variables in the nine within-case studies and the preliminary cross-temporal validity of H1 and H2, using the same nine case-study economies in the cross-case study in Section 2. Changes to the values of the variables up to ±10% from 2003 to 2013 is considered having the same trichotomous level.

<table>
<thead>
<tr>
<th>Economy</th>
<th>DV Level</th>
<th>OV (IV) Level</th>
<th>Private Capital Strength</th>
<th>Trust in Oil Markets</th>
<th>Oil Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>China 2003</td>
<td>49.78</td>
<td>16.26</td>
<td>56.25</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>China 2013</td>
<td>54.22</td>
<td>23.18</td>
<td>58.45</td>
<td>3.50</td>
<td>16.00</td>
</tr>
<tr>
<td>% changed</td>
<td>(+8.92%)</td>
<td>(+42.56%)</td>
<td>(+3.91%)</td>
<td>(+16.67%)</td>
<td>(+6.67%)</td>
</tr>
<tr>
<td>Prob. Congruent</td>
<td>Same</td>
<td>Higher</td>
<td>Same</td>
<td>Higher</td>
<td>Same</td>
</tr>
<tr>
<td>India 2003</td>
<td>24.15</td>
<td>27.17</td>
<td>57.75</td>
<td>4.00</td>
<td>9.00</td>
</tr>
<tr>
<td>India 2013</td>
<td>22.64</td>
<td>28.15</td>
<td>60.90</td>
<td>4.00</td>
<td>10.00</td>
</tr>
<tr>
<td>% changed</td>
<td>(-6.25%)</td>
<td>(+3.61%)</td>
<td>(+5.45%)</td>
<td>0.00</td>
<td>(+11.11%)</td>
</tr>
<tr>
<td>Prob. Congruent</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Higher</td>
</tr>
<tr>
<td>Indonesia 2003</td>
<td>105.56</td>
<td>12.51</td>
<td>56.55</td>
<td>4.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Indonesia 2013</td>
<td>63.06</td>
<td>21.90</td>
<td>65.10</td>
<td>4.00</td>
<td>8.00</td>
</tr>
<tr>
<td>% changed</td>
<td>(-40.26%)</td>
<td>(+75.06%)</td>
<td>(+15.12%)</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Prob. Congruent</td>
<td>Lower</td>
<td>Higher</td>
<td>Higher</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>Japan 2003</td>
<td>28.83</td>
<td>40.80</td>
<td>68.15</td>
<td>8.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Japan 2013</td>
<td>28.83</td>
<td>38.80</td>
<td>73.70</td>
<td>7.50</td>
<td>12.00</td>
</tr>
<tr>
<td>% changed</td>
<td>0.00</td>
<td>(-4.90%)</td>
<td>(+8.14%)</td>
<td>(-6.25%)</td>
<td>0.00</td>
</tr>
<tr>
<td>Congruent</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>Philippines 2003</td>
<td>1.28</td>
<td>38.82</td>
<td>62.55</td>
<td>5.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Philippines 2013</td>
<td>2.50</td>
<td>33.91</td>
<td>65.40</td>
<td>6.00</td>
<td>7.00</td>
</tr>
<tr>
<td>% changed</td>
<td>(+95.31%)</td>
<td>(-12.65)</td>
<td>(+4.56)</td>
<td>(9.09%)</td>
<td>0.50</td>
</tr>
<tr>
<td>Incongruent</td>
<td>Higher</td>
<td>Lower</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>Singapore 2003</td>
<td>48.04</td>
<td>48.04</td>
<td>86.95</td>
<td>8.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Singapore 2013</td>
<td>47.66</td>
<td>47.66</td>
<td>86.65</td>
<td>8.00</td>
<td>9.00</td>
</tr>
<tr>
<td>% changed</td>
<td>0.00</td>
<td>(-0.79%)</td>
<td>(-0.35%)</td>
<td>0.00</td>
<td>(-10.00%)</td>
</tr>
<tr>
<td>Congruent</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>S. Korea 2003</td>
<td>14.48</td>
<td>39.18</td>
<td>68.90</td>
<td>6.50</td>
<td>11.00</td>
</tr>
<tr>
<td>S. Korea 2013</td>
<td>38.39</td>
<td>36.44</td>
<td>71.55</td>
<td>6.50</td>
<td>11.00</td>
</tr>
<tr>
<td>% changed</td>
<td>(+165.12%)</td>
<td>(-6.99%)</td>
<td>(+3.85%)</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Incongruent</td>
<td>Higher</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>Taiwan 2003</td>
<td>64.00</td>
<td>37.59</td>
<td>71.30</td>
<td>6.50</td>
<td>10.00</td>
</tr>
</tbody>
</table>

115 I argue that a total 20% movement (±10%) within each trichotomous level on a 100% scale is reasonable since it is well within the 33% boundaries of three evenly distributed groups.
Table 3.20 Nine Within-Case Comparisons of DV, OV, and ITV Levels in 2003 and 2013

<table>
<thead>
<tr>
<th></th>
<th>Taiwan 2013</th>
<th>% changed</th>
<th>Probably Congruent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47.00</td>
<td>(-26.56%)</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>35.36</td>
<td>(-5.93%)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>76.15</td>
<td>(+6.80%)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>6.50</td>
<td></td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>10.00</td>
<td></td>
<td>Same</td>
</tr>
<tr>
<td>Thailand 2003</td>
<td>44.39</td>
<td>(-38.30%)</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>31.89</td>
<td>(-11.85%)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>64.85</td>
<td>(-0.39%)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>4.50</td>
<td></td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>8.00</td>
<td></td>
<td>Same</td>
</tr>
<tr>
<td>Thailand 2013</td>
<td>27.39</td>
<td>(-30.20%)</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>28.11</td>
<td>(-17.00)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>64.60</td>
<td>(-3.78)</td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>4.50</td>
<td></td>
<td>Same</td>
</tr>
<tr>
<td></td>
<td>9.00</td>
<td></td>
<td>Higher</td>
</tr>
</tbody>
</table>

The table above shows that Japan and Singapore are congruent with the expectations of H1. China, India, Taiwan, and Thailand are also likely to be congruent to the reasoning of the proposed model. Indonesia, the Philippines, and South Korea are incongruent, with South Korea being the truly deviant case. The results of each of these within-case studies are further discussed below.

All four explanatory variables as well as the DV levels of Japan and Singapore between 2003 and 2013 remain unchanged. Therefore, their situations match the expectations of H1. Japan’s slightly lower “trust in oil markets” score in 2013 is the result of its slow per capita GDP growth compared to some of the fast rising ones among its Asian cohorts. Japan’s relatively lower GDP growth in turn lowers its domestic context trust score slightly. If this had any bearing on policymakers’ decision in intervening in the economy’s oil supply, the effect was likely neutralised by the greater economic freedom of the country, and hence the greater strength private capital attained. It appears that the aggressive energy conservation and energy efficiency measures implemented over the decade and especially after the shutdown of nuclear power plants in Japan after 2011 have successfully contained the potential rise in oil consumption caused by the nuclear disaster.\(^{116}\)

Singapore’s lower overall implementation capability (but still within the same trichotomous level as defined in this study) is due to a drop in its diplomatic capability score as it no longer held the UNSC rotating membership in the decade leading to 2013.\(^{117}\) The very high historical-institutional economic freedom built in the system of Singapore, as

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\(^{116}\) There was a small spike in the oil consumed in Japan in the immediate aftermath of the nuclear disaster, that is from 2011 to 2012 (6.6% or from 203.6 to 217 million tons – MT). Japan’s oil consumption, however, continued to drop in the years since: 208MT in 2013, 197.3MT in 2014, and 189.6MT in 2015. See BP Statistical Review of World Energy June 2016, 11. Accessed 10 December 2016, https://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2016/bp-statistical-review-of-world-energy-2016-full-report.pdf.

confirmed by the almost non-existent strategic oil supply measures it adopted by 2003, renders this drop in potential oil diplomacy capability irrelevant.

The 2003 and 2013 situations in China appear to be concordant with the reasoning of the vulnerability-interaction model. China’s OV increased considerably over the decade studied due to its rapid decline in oil self-sufficiency rate. The effect the increased OV had on the DV, however, would be somewhat tempered by the slightly greater economic freedom, and hence greater strength of private capital, and its higher trust level in oil markets. China’s higher urbanization rate and per capita GDP boosted its domestic context trust score, and hence its overall trust score. Of course, these increases are small compared to that of the OV. The DV value, therefore, did end up higher. The higher DV value was due to the larger size of its SPR over the decade. The high baseline control (100%) the Chinese state had over the oil supply to the economy in and before 2003 also contributes to the relatively small increase in its DV value in 2013. The slight increase in China’s implementation capability in this study was due to its improved credit-worthiness.

At first glance, India’s situation is incongruent with the expectation of H2. The trichotomous levels of only one of the four explanatory factors, implementation capability, slightly increased over the decade. According to H2, the DV level should also change in the direction predicted by the reasoning of the vulnerability-interaction model. In this case, the DV level should have gone up, not remaining at the same level. Upon closer examination, India’s case is in fact congruent to the spirit, if not the letter, of the proposed model. The source of the slight increase in its implementation capability is its two-year UNSC rotating membership in the years leading to 2013. This is a relatively fleeting boost in diplomatic capability. In the meantime, its overall economic freedom, and hence private capital strength, increased slightly (but stay within the same trichotomous levels). The same is true for its OV. The fact that its DV value was slightly lower and again stayed within the same trichotomous level suggests that India’s freer overall economy had a greater impact on the strategic oil supply measures adopted. Indeed, the slightly lower DV value was due to the slightly lower percentage of government ownership in India’s NOCs. The divestment process was very slow, but did move forward. The more market-conforming strategic oil supply measure of building an SPR, which had been discussed for a long time, has not materialised by 2013, which is a testament to India’s relatively low overall implementation capability.

The situation of Taiwan is similar to India, but in relation to H1. Its four explanatory variables remain at the same trichotomous levels, but its DV level was lower, apparently

118 It scored zero on the strategic oil supply indicator in 2003 as the state has already sold off its ownership in its NOC, the Singapore Petroleum Company, and did not hold any SPR.

119 See footnote 102 above.
incongruent to the expectation of H1, which states that the DV level should remain the same under such a circumstance. Again, upon closer examination, the situation does not seem that incongruent any more. The vulnerability-interaction model posits that both the slight increase in economic freedom and decrease in OV would lower the strategic oil measures a state would adopt. The disproportionally large decrease in Taiwan’s DV value reflects its relatively fast downstream oil sector liberalization over the decade, thus lowering the percentage of crude oil supplied to the economy by its NOC, the CPC Corporation.

In the case of Taiwan, neither its higher economic freedom nor its lower OV was large enough by themselves to change to a different trichotomous level. Since these two changes are both hypothesised to lead to the adoption of fewer strategic of supply measures, or a lower DV, together, the DV reading of Taiwan dropped enough to a trichotomously lower level. Taiwan’s case, therefore, is congruent to the spirit of the vulnerability-interaction model and points to a way to refine its prediction. Taiwan’s case suggests that when two or more explanatory variables change in a direction that is supposed to contribute to the same direction of change in the DV, they would interact to produce a larger effect on the DV than the degrees of change in the individual explanatory variables.

The liberalisation of the Thai oil sector also led to a considerably lower DV value of the country over the same period, but through a lower percentage of government ownership in the Thai NOC PTT. Two of Thailand’s explanatory factors changed levels and so the vulnerability-interaction model is not specified enough to predict the interaction effects of the changes. Still, it can be reasonably argued that Thailand’s situation appears to be congruent to the spirit of the model. Thailand’s lower OV is a combination of a 74% increase in indigenous oil production and its GDP rise, which lowered the per capita import cost of oil into the Thai economy. The impressive increase in oil production was at least partially caused by its oil sector liberalisation. Thailand’s implementation capability increased because its foreign exchange reserves almost quadrupled in 10 years. Similar to, but to a greater extent than, the case of India, a slight increase in capability without any change in the overall trust level in the oil markets, does not seem to have much impact on the Thai DV level. Consistent with the reasoning of the vulnerability-interaction model, in the case of Thailand, the drop in OV level is the decisive factor.\textsuperscript{120}

4.1 Within-Case Studies Inconsistent With Cross-Temporal Expectations of H1 and H2

A higher level of overall economic freedom should lower the country’s DV level while an increase in OV level should have the opposite effect. The effect on the DV when

\textsuperscript{120} In the case of India, the increase in OV is very small and there is a greater, although still small, increase in overall economic freedom which would have a countervailing effect.
both of these conditions occur at the same time cannot be specified at this point. Indonesia’s OV increased more than 75% over the decade. In fact, with an OV value of just over “12” in 2003, Indonesia had barely become a net oil importing economy as defined by this study.\footnote{121} Such an increase should raise the DV level of the country, even with the country’s freer economy.\footnote{122} Instead, there is a considerable decrease in Indonesia’s DV value. At first glance, therefore, it should be considered incongruent with the reasoning of the proposed model.

The main source of the dramatic increase in Indonesia’s OV is its simultaneously lower oil production and higher oil consumption. Ironically, these same dynamics also lead to the decrease in the DV level in the unique case of Indonesia. The state continued to have a 100% control in the country’s crude oil supply through the state monopoly in refining capacity. Indonesia, did not have a separate SPR. Instead, the same operating stock of 20-day oil demand kept by its NOC is counted as the country’s “SPR” in both 2003 and 2013. With the country’s much lower oil self-sufficiency rate in 2013, however, the same 20-day worth of demand stock was equivalent to only 47 days oil import amount versus the 200-day equivalent in 2003.\footnote{123} In fact, within the parameters of this preliminary study, the only way Indonesia could have increased its DV value would be to either build a large SPR or mandate a much higher operating stock of its NOC. It appears that neither was within the capability of the country.

On the surface, the case of the Philippines is incongruent with the expectation of H2. Among the four explanatory factors, only its OV level changed. Its lower OV level should result in a lower DV level according to the expectation of H2. Instead, it shot up over 95%. As with Indonesia, this case is a little more complicated than it initially appears. First of all, the Philippines’ slightly higher trust score as well as its slightly higher economic freedom score should lower its DV value. The Philippines’ NOC became a less coherent oil securitising agent due to further liberalization of the Philippine oil sector, which has started in the 1990s when oil prices were low.\footnote{124} This slightly increased the country’s overall trust score according to the reasoning of the proposed model. By 2009, after completely divested

\footnote{121} A net oil importing state is defined as one having an OV value of over 10. See footnote 71 in Chapter Two. For the calculation of Indonesia’s and other case-studies’ 2003 OV, see Table A8, Appendix B.
\footnote{122} The vulnerability-interaction model does not predict proportional changes in explanatory factors and DV values to begin with.
\footnote{123} As explained in section 2.1 in this chapter, it is the equivalent number of days of oil import that is used to calculate the size of an economy’s SPR in this study as is also stipulated by the IEA.
\footnote{124} The privatization of major oil refining company in the Philippines, Petron Corporation started in 1994 and by 2003, PNOC owned 40% of it, while Saudi-Aramco, the NOC of a major oil producer, Saudi Arabia, owned another 40% and the public owned the remaining 20%. See PNOC – The Energy Company – 1973 – 2003 30th Anniversary Report, 23.
its shares in the country’s major refinery, Petron, PNOC, the Philippine NOC no longer control the crude oil supply to the economy.125

Ironically, the Philippines’ great increase in DV value was due to private oil firms’ development of the indigenous resources, not greater direct control of it by PNOC or its upstream subsidiary PNOC EC. The greater amount of oil produced over the decade indirectly increased the government’s theoretical “control” of them through the same 60% the government share of the oil developed.126 In reality, the government likely only collected 60% of the proceeds from the oil developed, not take the oil in kind.127 This increased production together with a simultaneously lower consumption caused a drop in the economy’s OV.128

The case of South Korea is definitely incongruent with the expectation of H1. All of its explanatory factors remained at the same level over the decade, and H1 predicts that its DV should also remain the same. Instead, it shot up over 165% during the timeframe reviewed here. Unlike the cases of Indonesia and the Philippines, the increase in Korea’s DV level appears to be due to active government actions to have greater control over the economy’s oil supply and its upstream oil sector.129 Both the oil developed by its NOC the KNOC and the size of its SPR, the two DV component measures used in this plausibility probe, increased considerably.130 In the meantime, its overall economic freedom increased slightly and its OV slightly decreased. Both of these conditions are supposed to lower the value, if not the level, of its DV. The situations of South Korea during the period studied, therefore, present a true deviant case not only to the cross-temporal applicability of H1, but also among the nine case-study economies.


126 That is how the Philippines’ state control of oil supply was calculated in this study. See Table 3.1 above and Table A8, Appendix B.

127 See Section X of the Philippine Department of Energy model petroleum service contract, which discusses these two possibilities regarding the proceeds of oil production.

128 It is unclear whether conservation measures, unaffordability or other unknown reasons caused the drop in oil consumption in the Philippines over the decade studied.


This chapter’s concluding section applies alternative theories to see if any of them better explain the case of South Korea as well as other cases in the plausibility probe. The following section summarises the overall plausibility of the different dimensions and hypotheses of the vulnerability-interaction model.

5. Overall Validity of Vulnerability-Interaction Model

This chapter has employed structured and focused comparisons to examine all the variables of the vulnerability-interaction model in nine case-study economies to preliminarily probe its plausibility before exerting more intensive effort to investigate a few more promising cases relevant to further development of the model. The data show that overall the model is plausible and worthy of further investigation of its validity and refinement in the following chapters as described below.

2.2 Validity of H1 and H2

The first layer of the vulnerability-interaction model is designed to answer the first research question of what explains the variations in the levels of strategic oil supply measures adopted by the oil importing economies. The cross-case dimension of H1 and H2 specifically tries to explain the variations among these economies at the same period of time. The overall cross-case validity of H1 and H2 is 67% with 2013 data.

As discussed in Section 3 above, the pair of economies that has all four explanatory factors (IV & ITVs) at the same levels in 2013 is India and Thailand. These two economies also have the same level of DV. Therefore, they match the parameters of H1 and are selected to conduct an in-depth investigation of the cross-case validity of H1 in Chapter Four of this thesis. There are great differences between India and Thailand, including the relative sizes of their populations, land areas, and economic conditions, as well as other possible factors that may explain the levels of strategic oil supply measures they adopted. The similar results of all the levels of all their variables as presented on Table 3.18, therefore, fits the requirements of the most different research design.131

Five paired comparisons emerged with the parameters of H2, that is, only one pair of the four explanatory variables has different levels. Three of these five pairs, or 60% of the cases, have DV levels consistent with the reasoning of the vulnerability-interaction model as detailed Table 3.19 above. The cross-case dimension of H2 alone, therefore, has a congruence rate of 60%.

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131 For a discussion of how the “most different” research design expands the applicability of controlled comparisons, see George and Bennett, 164-165. For a discussion of the “least likely” cases, see John Gerring, “Is There a (Viable) Crucial-Case Method?” Comparative Political Studies, 40-3 (March 2007), 233-237.
Among these three pairs of candidates, China and India are the best cases to further investigate the cross-case validity of H2 in Chapter Four. First, as pointed out earlier, H2 suggests the one differing explanatory factor would demonstrate the logic of the proposed model. Therefore, it would be easier to examine this if both the DV and explanatory factor levels of the economies concerned are greater. Although all candidate pairs listed in Table 3.19 only have a one- but not two-level difference in their respective explanatory factor, the extents of the actual differences between the scores of the explanatory factor in question do vary. As indicated in Table 3.21 below, China and India have the greatest difference in their DV values among the three pairs of economies with outcomes that are congruent with the propositions of the vulnerability-interaction model, which are in boldface. Although the difference between the explanatory variable between China and Thailand is greater than that between China and India, China and India are more similar in a number of aspects than the other pairs. The absolute sizes of China and India’s economies, populations, and geographic areas, for example, are relatively similar. This would minimise the number of confounding factors that may have a bearing on their DV levels, which serves to further the conditions for a “most similar cases” comparison inherent in the logic of H2.

<table>
<thead>
<tr>
<th>Economies Having One-Level Difference in One Explanatory Factor Only:</th>
<th>Standard Deviation in DV</th>
<th>Standard Deviation in Explanatory Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>China and India</td>
<td>1.46</td>
<td>2.25</td>
</tr>
<tr>
<td>China and Thailand</td>
<td>1.24</td>
<td>2.63</td>
</tr>
<tr>
<td>Japan and Singapore</td>
<td>1.33</td>
<td>1.23</td>
</tr>
<tr>
<td>Singapore and Taiwan</td>
<td>2.17</td>
<td>1.51</td>
</tr>
<tr>
<td>South Korea and Taiwan</td>
<td>0.40</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Table 3.21 Difference in DV and Explanatory Factor by Standard Deviation Among H2 Candidate Pairs in 2013

5.1.1 Cross-Temporal Validity of H1 and H2

The vulnerability-interaction model posits that the same explanatory variables should also explain variations of the level of strategic oil supply measures adopted within the same economy over different periods. H1 and H2, therefore, also have a cross-temporal dimension. Section 4 tests this dimension with nine within-case studies with 2003 and 2013 data. Four of the nine cases, Japan, Singapore, South Korea, and Taiwan emerge with H1 parameters. Japan and Singapore had the same DV level over the decade studied and so are congruent with the expectation of H1. South Korea had a higher DV level and is a deviant case. Taiwan’s case appears to be consistent with the spirit, but not the strict conditions of H1 as it has a lower DV level. Even without counting Taiwan, the cross-temporal congruence rate of H1 is still 50%.
In contrast, India has a higher implementation capability in 2013, but its DV level remains the same. Therefore, it appears to be incongruent with the expectation of H2 as the vulnerability-interaction model suggests that a higher capability should result in a higher DV level if everything else remains the same. Similarly, the Philippines has a lower OV, but a higher DV in 2013. It is, therefore, incongruent with the expectation of H2 as the proposed model suggests a lower OV would lead to a lower DV. Overall, if we take the strict literal interpretation of H2, the cross-temporal dimension of it has a zero congruence rate. If a more relaxed view is taken, India’s case should easily be considered congruent to its expectation and hence 50% of the cases are congruent. Due to the constraints of time and space of this thesis, further examination of the cross-temporal validity of H1 and H2 will be left for future research.

5.2 Validity of H3 and H4

The second layer of the vulnerability-interaction model addresses the second research question of what causes net oil importing states to adopt a high level of strategic oil supply measures during a period the international oil markets have been well established and domestic oil governance is generally being liberalised. This layer generates H3 and H4 as re-stated below:

H3: A net oil importing economy that has adopted a high level of strategic oil supply measures would have a high capability, high OV, high-strength private capital, and a medium level of trust in oil markets (three-high case)

H4: A net oil importing economy that has adopted a high level of strategic oil supply measures would have a high capability, a noticeable OV, and must NOT have high trust in oil markets, nor high-strength private capital (non-three-high case)

Each of these hypotheses proposes a unique causal pathway (INUS cause) that would lead to the adoption of a high level of DV. As discussed in Chapter Two. The vulnerability-interaction model also hypothesises a “third” pathway that would lead to the adoption of a high DV. This pathway is the one of the two “extreme” cases discussed in Chapter Two. An economy having a high OV, a low trust in the oil markets, a high capability, and that in which private capital is weak versus the state is hypothesised to also adopt a high level of strategic oil supply measures. In spite of the mostly comparative nature of the levels of variables generated in the first layer in this plausibility probe, the summary of the variable levels shown on Table 3.18 does provide a sound basis for the

132 A more careful examination of this “extreme” pathway shows that it is actually a variant of non-three-high case as proposed by H4, but before all the compressions are made. The “extreme case” for the adoption of a low or no DV (low OV, high trust, low capability, and high-strength private capital) does not emerge with 2013 data of the nine case-study economies.
levels of these variables on a larger scale. Since the Asia-Pacific has a relatively low oil self-sufficiency globally, we may modify the search of such “extreme cases” to include all the economies having both high and medium OV levels. Still, none of them fit the descriptions of this third pathway. Therefore, we should proceed to search for cases that may fit the parameters of H3 and H4.

There are three economies that are shown to have a high DV level in 2013 on Table 3.18: China, Indonesia, and Taiwan. We can safely assume that net oil importing economies having a DV in the Asia-Pacific would also have a high DV by global standards. Hughes’ *Globalizing Oil* documents the liberalising trend in oil governance in 15 advanced industrialised countries between 1985 and 2005. The average percentage of state ownership of oil firms compiled with those data is only about 19%. It is likely that this number has dropped further by 2013 with the continuing liberalisation trend in those countries. Besides, the United States is not included in that 15-country study. Otherwise, the overall result would be further lowered. The results of the similar, but not exactly the same, component of China, Indonesia, and Taiwan in this study in 2013, as shown on Table 3.1 above, are 99%, 100%, and 44% respectively. They, therefore, can be considered having a high DV by almost any standards.

5.2.1 Validity and Case Selection of H3

Taiwan is selected to further assess the validity of H3 as a possible three-high case. The rest of this sub-section justifies this selection. To fit the criteria of H3 or the three-high cases, apart from having a high level of DV, economies also need a high OV, high capability, high-strength private capital as manifested as having a high degree of overall economic freedom, and a medium level of trust in oil markets. None of the nine case-study economies in this plausibility probe with 2013 data fits all four stipulations. In view of the generally high OV level among net oil importing states in the Asia-Pacific, the next logical step is to examine if any of the economies deemed to have a medium OV would satisfy the remaining criteria of H3. These three economies are the Philippines, South Korea, and Taiwan. Taiwan has already been determined to have a high DV. Since the Philippines only had a low DV level, it is eliminated for consideration. South Korea, like Japan, which already had a high OV, only had a medium, not high DV. Table 3.22 below summarises the situation of these four candidates:

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133 The oil self-sufficiency rate of the Asia-Pacific in 2013 was 27.7%, versus North America’s 76.26% and Europe and Eurasia’s 95.32%. See Table 5.1 in Chapter 5 for details.
134 Hughes’ *Globalizing Oil*. 243-247. See Table A6, Appendix B for the calculation of the average of the 15 advanced industrialised countries.
135 As further discussed below, the other high-DV economy China, fits the stipulations of H4 or the non-three high cases and hence is excluded from consideration as an H3 candidate here.

93
<table>
<thead>
<tr>
<th>Economy</th>
<th>DV Level</th>
<th>OV (IV) Level</th>
<th>Strength of Private Capital</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect Fit (Three-High Case)</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Indonesia</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>South Korea</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 3.22 2013 Variable Levels of Candidates for In-Depth Investigation of H3 Against Perfect Fit

The variables not concordant with the perfect fit of the criteria of H3, as listed on the second row of the table, are shaded in two different weights, signifying different degrees and aspects of incongruity. The darker shading represents further away from the expectation of H3. First, none of the four candidates had medium level of overall trust in oil markets as stipulated in H3. Trust in the oil markets is likely to encompass components beyond the ones used in this plausibility probe. Therefore, the level of trust is put aside for now to ascertain if one of the candidates is a better fit than the other two.

Once the variable of trust is temporarily disregarded, Japan appears to be a promising candidate as the only other issue is that it had is having a medium, not a high DV. Can its medium DV among the other Asia-Pacific case-study economies be reasonably understood as a high level globally? As shown on Table 3.4, Japan’s DV score with the preferred weighting method is 28.83 in 2013. The lowest “high” level DV score of the same weighting method in this plausibility probe is 47, received by Taiwan. A yardstick that extends beyond the current study would be the score the United States would receive using the same proxies, which is about 38. While the DV score of the United States is not low, most would agree that it does not fit the profile of a state that implements a high level of strategic oil supply measures globally. Based on the lowest of the “High” category score received by Taiwan and the score of the United States, Japan cannot reasonably be said to have implemented a high level of strategic oil supply measures in 2013. Therefore, it is deselected as an in-depth case study to assess the validity of H3.

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136 See Table 3.4.
137 The percentage of government control of crude oil supply to the United States is 0. While the amount of SPR fluctuates somewhat, as of 2015, that amount is 137 days of import equivalent (See “SPR Quick Facts,” U.S. Department of Energy website, accessed 20 March 2016, http://energy.gov/fe/services/petroleum-reserves/strategic-petroleum-reserve/spr-quick-facts-and-faq). The resulting score is 38.06 if no cap is used for SPR over the 90 days IEA standard. The score would be 25 if the SPR is capped at 90 days as 100%. 31.5 is the average of these two scores. Japan has the same score whether the SPR is capped at 100% or not as it has 85 days of import equivalent of state administered SPR in 2013. China also has the same score with or without the cap.
138 Adding the United States to the nine economies already in this plausibility probe to run the same averaging and standardising procedures, the United States receives the designation of” medium” while Japan’s designation remains unchanged as medium.
The choice thus narrows down to Indonesia, South Korea and Taiwan. Like Japan, South Korea only has a medium, not high DV in 2013 among the nine case-study economies, but its DV score with the same weighting method is considerably higher at 38.39. If the same extended yardstick of the United States is used to run a 10-economy average, however, South Korea’s DV remains only at a medium level.\textsuperscript{139} Besides, South Korea has three other apparently incongruent variables versus Taiwan’s two, and the levels of the two common incongruent variables are the same for both economies. Since the whole \textit{raison d'etre} of this static layer is to investigate the causes that drive states to implement a high level of strategic oil supply measures, Taiwan is a better choice. Then what about the other high-DV economy, Indonesia? Like South Korea, none of its four explanatory variables match the levels stipulated by H3 and two of them, the ones with darker shading, had a two-, instead of one-level difference from the perfect fit of H3.

Taiwan’s DV level remains high after the United States is added to the averaging and standardising process. The lightly shaded cells in Table 3.22 indicate the apparently incongruent variables that may become congruent on a more global scale. Alternatively, these are truly incongruent variables that would lead to the refinement of the causal pathway leading to the adoption of a high level of strategic oil supply measures. In any event, Taiwan is examined in-depth in Chapter Five as a deviant case since it does not conform to all the stipulations of H3. Its investigation would point to better explanations of Y, the adoption of a high level of strategic oil supply measures.

The validity of H3 cannot be determined at this point since none of the nine cases with 2013 data match the parameters of it. Taiwan is selected to further examine its validity as a deviant case in Chapter Five.

5.2.2 Validity and Case Selection of H4

China is selected as the best case to further assess the validity of H4 as a non-three-high case. It is the only perfect fit for all the criteria of H4 among the nine case-study economies with 2013 data. Indonesia is close, but it only had a low capability. It is unlikely to be deemed as having a high capability by any other standards. Further, none of the other states in this preliminary study with a medium level of DV is pushed up to become one with high DV when the United States is added to the analysis.\textsuperscript{140}

The rest of this section shows that by applying techniques recommended by leading qualitative methodologists, the result on H4 obtained by this preliminary study has a high level of substantive significance. The preliminary validity of H4 may be illustrated by using two-by-two tables, a common method used by qualitative scholars to demonstrate the

\textsuperscript{139} Ibid.

\textsuperscript{140} See footnotes 137 and 138 above.
validity of the necessary or sufficient causes they propose. H4 is conceptualised as an INUS cause to a high level of strategic oil supply measures (DV) adopted, which is a form of sufficient cause. Each explanatory factor at its stipulated level is a necessary condition making up that particular pathway or INUS cause. Therefore, two-by-two tables for sufficient causes are suitable to examine the plausibility of H4.

A blank two-by-two table for a sufficient cause looks like Table 3.23 below:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N₁</td>
<td>N₂</td>
</tr>
<tr>
<td>0</td>
<td>N₃</td>
<td>N₄</td>
</tr>
</tbody>
</table>

Table 3.23 Two-by-two Table for Sufficient Cause

In Table 3.23, X is the sufficient cause being investigated. In this study, they are INUS causes. In this illustration, it entails the stipulated levels of the four explanatory factors in H4. Y is the outcome or DV studied, which is a high level of strategic oil supply measures adopted for H4. Zero means the absence of that outcome or cause and 1 the presence of it. The (X, -Y) cell at the bottom right hand corner of a sufficient cause table must have zero case for the sufficient cause to be established.

Table 3.24 below shows the sufficient cause table for H4 by using the levels of the variables show on Table 3.18:

<table>
<thead>
<tr>
<th></th>
<th>Not having H4 configuration</th>
<th>Having H4 configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>High DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not High DV</td>
<td>6</td>
<td>1 (China)</td>
</tr>
<tr>
<td>(India, Japan, Philippines, Singapore, South Korea, Thailand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High DV</td>
<td>2 (Indonesia, Taiwan)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.24 2 x 2 Table of H4 as Sufficient (INUS) Cause for Adopting High Level of Strategic Oil Supply Measures

A specific aspect to note about Table 3.24 above is that it has zero case in its (X, -Y) cell at the bottom right. This means that with the data in this chapter, the INUS cause of H4 proposed by the vulnerability-interaction model that would lead to the adoption of a high level of strategic oil supply measures is successfully established. Goertz and Mahoney point out that data on two-by-two tables may be “translated” into $\chi^2$ or correctional

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141 For a good discussion and demonstration of the use of two-by-two tables in qualitative studies, see Goertz and Mahoney, *A Tale of Two Cultures*, 21-23.
142 It is not possible to use two-by-two tables to evaluate the validity of H1 and H2 because of their relative logic and a relatively low degree of specificity.
143 Goertz and Mahoney, *A Tale of Two Cultures*, 21.
144 This cell is named the “sufficient condition cell.” Ibid., 22.
The odds ratio of the H4 INUS as presented in Table 3.24 is 0.13. This is a highly significant result as it is much smaller than ‘1,’ which indicates the odds of the outcome occurring are the same with or without the exposure to the proposed cause. Two-by-two tables ultimately, however, more strikingly illustrate the relationship of sufficiency in set logic, which underpins this project, not statistics.

Chapter Four will present more explicit data related to the explanatory variables and strategic oil supply measures adopted by China in years leading to 2013 as part of the in-depth investigation of the validity of H2 in the paired comparison of India and China. Many other aspects of China’s policies and measures related to state intervention in its oil sectors have also been extensively examined in related studies as discussed in the literature review of this thesis. The analysis in this sub-section shows that the case of China in 2013 unequivocally confirms the reasoning behind the INUS cause of H4 to the adoption of a high level of strategic oil supply measures. Due to the need to limit the parameters of this study’s scope, therefore, this project will not further investigate the case of China to verify the validity of H4.

How does the overall validity of the vulnerability-interaction model summarised in this section fare compared to alternative theories? The concluding section below weighs this question as well as summarising initial insights gleaned from the plausibility probe developed here.

6. Conclusion

The plausibility probe presented in this chapter shows that the vulnerability-interaction model stands up well compared to the only applicable alternative approach at this stage – the conventional Realist/geopolitical explanation of why (net oil importing) countries intervene in their economies’ oil sectors.

The structural Realist or geopolitical perspective attributes a high level of state intervention in the oil sector to a high implementation capability of the states and the strategic importance of oil to the security and material development of the country. According to this logic, only countries with high implementation capabilities would be able

145 Ibid., 23.
146 Results obtained by using the odds ratio calculator on the “MedCalc” website, accessed 22 February 2016, https://www.medcalc.org/calc/odds_ratio.php. Admittedly, the INUS does not have a high significance level with the p value at 0.25. This, however, should be expected with only nine cases, but the odds ratio suggests a substantive significance of the hypothesised pathway to the adoption of a high level of strategic oil supply measures.
147 Goertz and Mahoney, 23.
148 Goertz and Mahoney, ibid.
to adopt a high level of strategic oil supply measures. Table 3.18 shows that only one of the three high DV economies, China, had a high implementation capability in 2013.

The vulnerability-interaction model also hypothesised a high implementation capability as an *a priori* condition for the adoption of a high level of strategic oil supply measures. In this regard, the proposed model as it is currently formulated fares no better than the conventional Realist perspective in explaining the two cases of high DV economies without a high capability. The vulnerability-interaction model, however, does specify three other major necessary conditions that are needed for the outcome of the adoption of a high level of strategic oil supply measures in each of the proposed causal pathways. Chinese conditions in 2013 match one of them, H4. Since the Realist perspective puts great importance in the strategic value of oil, one would expect a country with a high OV and high capability would be the top candidate to adopt a high level of strategic oil supply measures according to this perspective. China, however, in fact only had a low OV in 2013. In this regard, the vulnerability-interaction model has more precise predictability than the Realist approach.

If we extend the conventional Realist logic further, countries are expected to adopt a level of strategic oil supply measures either comparable to their capability levels, their OV levels, or both, which appears to be closest to this perspective’s reasoning. If we apply the “capability yardstick” alone, according to the results shown on Table 3.18, five of the nine case studies have matching capability and DV levels: China, India, the Philippines, South Korea, and Thailand. This translates into a congruence rate of 56%. If we just apply the “OV yardstick,” only one of the nine case studies, South Korea, has matching OV and DV levels. If we apply both yardsticks together, four of the nine case studies, Indonesia, Japan, South Korea, and Taiwan, have matching OV and capability levels, but only one of the four, South Korea has the same DV level as those two explanatory variables – medium. The cases where these two explanatory factors are of different levels, the Realist theory is not specified enough to predict what the DV level would be. The overall cross-case congruence rate of H1 and H2 is 67% and that of H2 alone is 60% and so the vulnerability-interaction model has a better overall predictive power than the Realist approach in cross-case comparisons.

Still, the Realist perspective, if formulated as predicting the level of strategic oil supply measures adopted by states to be the same as both their economies’ capability and OV levels, appears to better explain the case of South Korea in 2013. The conventional Realist perspective, however, cannot explain the vulnerability-interaction model deviant cases of Taiwan or Indonesia.

How well does this Realist perspective explain changes in the within-case comparisons? If only the capability yardstick is used, it correctly explains three of the nine cases, meaning directions of these cases’ capability level change match those of their DV
level change (or lack thereof). Therefore, it has a congruence rate of 33%. China, Japan, and Singapore’s capability and DV levels remain the same over the decade. If the combined capability and OV yardstick are used, only the two no-change cases of Japan and Singapore are consistent with the prediction of the Realist perspective. Overall, therefore, the conventional Realist perspective does not have a greater validity than the cross-temporal dimension of the vulnerability-interaction model. Even the strict interpretation of this dimension of H1 has a 50% congruence rate, while the congruence rate of H2 in this dimension can be interpreted as either zero or 50%.

Of course, the validity of the vulnerability-interaction model must be further verified with more fine-grained data in Chapter Four and its propositions refined or overhauled regarding H3 in Chapter Five before meaningful insights to the two research questions may be offered. Two observations do begin to emerge from this plausibility probe. First, the fluctuations in oil prices in the international oil markets over time do not contribute to changes in economies’ OV as much as changes to their oil self-sufficiency rates. China’s oil self-sufficiency rate, for example, dropped about 21% while India’s dropped slightly over 8% in the decade studied. In the same period, China’s per capita income grew faster than India’s, which should make the increase in oil prices in the decade more affordable to China. Instead, as shown on Table 3.22, China’s OV grew more than 10 times that of India’s. In economies as big as China and India’s, which consume large absolute amounts of the total oil consumed in the world, the effect of any change in their oil self-sufficiency rates is magnified by the effort needed to secure that amount in the market, which acts as a feedback loop. The same logic should apply both in a tight oil market and an oil glut situation, and to other major net oil consumers, such as the United States. This logic would, therefore, have repercussions to the global effects of the shale oil revolution in the United States, which will be further discussed in the concluding chapter.

The disproportionally large effect of changes in oil-sufficiency rates or conversely the relatively small impact of fluctuations in oil prices on net oil importing economies’ OV is also observed in the case of Indonesia. Its oil self-sufficiency rate dropped from over 99% in 2003 to less than 58% in 2013 (an about 42% drop). As shown on Table 3.22, its OV, however, increased over 75% despite a 47% increase in per capita GDP in the same period. This skyrocketing increase in the country’s OV within a relatively short period may explain the outlier results of Indonesia as illustrated in Table 3.18. Indonesia has a high DV, yet a low OV and a low implementation capability among Asian net oil importing economies in 2013. It is likely that decision-makers and the public there alike were still adjusting to the

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149 China’s grew about 3.1% versus India’s about 2.2%. Source of calculation is from the World Bank.
country’s identity switch from a century-long net oil exporter to a net oil importing state a
decade earlier. Indonesia’s 2015 request to reactivate its OPEC membership after a seven-
year suspension appears to support this proposition. Its economic nationalism over its still
large, but fast dwindling, indigenous oil resources as of 2013 acted as a barrier to the
country’s oil sector liberalisation. The resulting unusually high DV level compared to
both the expectation of the vulnerability-interaction model and among Asian net oil
importing economies is at least partially attributed to these unique circumstances. The
Indonesian case, therefore, is truly an outlier and has confounding variables that are not
applicable to most other net oil importing economies.

Second, as alluded to earlier, it appears that the effect on the DV level of a higher
implementation capability would not be “triggered” without a simultaneous drop in the
economy’s overall trust in the oil markets. The cross-temporal cases of India and Thailand
seem to attest to this. This is only a tentative observation since as discussed in Section 4.2,
the levels or at least values of other explanatory variables change at the same time in these
cases. Still, if this is confirmed to be true in further research, it is actually concordant with
the reasoning of the vulnerability-interaction model, which sees trust in the oil markets as
the central intervening variable in which the levels of other explanatory variables have to
filter through before policy actions would be taken. This observation may also provide
refinement to the vulnerability-interaction model, especially the hypothesised pathways to
the adoption of a high level of strategic oil supply measures.

150 Its OPEC membership was reinstated as of 1 January 2016. See Huileng Tan, “Could
Indonesia’s Entry Complicate an OPEC Production Cut?” CNBC website, 3 December 2015,
accessed 20 March 2016, http://www.cnbc.com/2015/12/03/could-indonesias-entry-complicate-an-
opec-production-cut.html. Also see “Indonesia facts and figures,” OPEC website, accessed 20
151 Former OPEC Secretary-General Roberto Suburot of Indonesia was quoted saying in 1994:
“Although several decades have passed since the era of nationalization [of oil resources in producing
countries], our national oil companies continue to possess a rather unique political status in the eyes
of their respective nations. They are still regarded as the symbol of national sovereignty that controls
the most important and the most valuable resource endowment in our countries.” See Marcel and
Mitchell, Oil Titans, 2.
152 It has the highest DV score, 63.06, among the nine case-study economies. See Table 3.4.
Chapter Four
Explaining Cross-Case Variations in State Intervention

1. Introduction

This chapter offers two pairwise comparisons to further examine the cross-case validity of the vulnerability-interaction model. The cross-case dimension of the proposed model explains variations in the levels of strategic oil supply measured adopted by net oil importing states at any given time. Two hypotheses - H1 and H2 – are generated here to explain the phenomena. The years immediately preceding 2013 are reviewed because they represent the end of roughly a decade of rising oil prices.

The pairwise comparison between India and Thailand investigates if the trichotomous levels of the two economies’ four hypothesised explanatory variables as well as their dependent variable (DV) remained the same. If these conditions hold up under closer scrutiny with more data presented in this chapter, the similar levels of strategic oil supply measures India and Thailand adopted around 2013 can be explained by the similar levels of their oil vulnerability (OV), trust in the oil markets, private capital strength, and implementation capability. This is the essence of H1.

The pairwise comparison between China and India determines if China’s implementation capability and DV levels were indeed considerably higher than India’s while the levels of their other three explanatory variables were similar. If these conditions do indeed emerge in this comparison, it would suggest that the higher level of strategic oil supply measures adopted by China around 2013 could be explained by its higher implementation capability. This would match the expectation of H2 and bolster the validity of that hypothesis.

As was in Chapter Three, structured, focused comparison is again used to conduct these cross-case comparisons. The more in-depth investigation in this chapter provides better qualitative assessment of complex concepts as a robustness check of the vulnerability-interaction model to the more quantitative assessment in the previous chapter. Content analysis of the annual reports of pertinent NOCs is also conducted to ascertain if there is any evidence of NOCs acting as securitising or powerful lobbying agents of oil supply security to the economies in questions. Using more “open-ended” qualitative data to supplement the more close-ended quantitative data used in the plausibility probe increases the credibility of the results.1

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This chapter starts with a synopsis of the history of the politics of the oil industries in India and Thailand and a comparison of India and Thailand to examine the cross-case validity of H1. This structure is repeated in the second half of the chapter with the cases of China and India of the same period to examine the cross-case validity of H2. The concluding section summarises the results of these comparisons.

2. Politics of Oil in India and Thailand

India’s oil industry has shifted from being dominated by international oil companies (IOCs) in the first decade after its independence to being mostly government-owned and operated by the late 1960s, to gradual liberalisation since the late 1980s. This meandering history of the politics of oil has been entwined with India’s larger post-colonial economic developmental experience and evolving ideological orientation and strategic alignment. During the period studied, efforts to liberalise the domestic oil product pricing structure and to divest national oil companies (NOCs) to increase efficiency were countered by bureaucratic red tape and inertia, the impulse of state control over indigenous natural resources, and fear of backlash against oil product price hikes, aided by the rhetoric of securitization.

Thailand’s oil industry had also been dominated by IOCs until the last two decades of the 20th century when the Petroleum Authority of Thailand (PTT) was established as a response to the oil price shock in December 1978. The PTT and its exploration and production (E&P) subsidiary were transformed into public limited companies and have remained majority-owned by the state. The overall government control of oil supply to the Thai economy, as demonstrated in Chapter Three, was very similar to that in India as of 2013. Both the laws governing the E&P of indigenous petroleum resources and the oil product pricing structure were more market-conforming in Thailand during the period studied, but far from being unfettered. This provided more room for the continued operation of IOCs in Thailand.

Yet, further divestment of the Thai NOC and lowering of state intervention in the Thai oil sector appear to be hindered by similar factors and rhetoric as in India, even if the specifics and many other circumstances in the two countries were different. The relatively

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4 See Table 3.1 in Chapter 3. One possible explanation of this is the relative efficiency of the PTT.

5 See Section 2.1 in this Chapter for more details, especially footnotes 29-39.
low oil vulnerability (OV) of these two countries among Asian net oil importing economies does not result in a low level of strategic oil supply measures in either. The relatively low strength of private capital and trust in oil markets hampered oil sector liberalisation while moderate state capability put a check on any desire to augment these measures, resulting in an overall medium level of intervention in both. H1 of the vulnerability-interaction model states that if the four major proposed factors modulating intervention in two economies are at similar levels at any given time, the overall levels of state intervention in oil supply to their economies would also be similar. The in-depth pairwise comparison in the next few sub-sections confirms this sums up the situations of India and Thailand as of 2013.

**Comparison of India and Thailand in 2013:** The variable levels of India and Thailand with 2013 data match the parameters and outcome stipulated in H1 in the preliminary study. This means that all the trichotomous levels of key explanatory factors and the levels of the strategic oil supply measures they adopted were the same. This is summarised below:

<table>
<thead>
<tr>
<th>Strategic Oil Supply Measures Adopted (DV Level)</th>
<th>OV (IV) Level</th>
<th>Strength of Private Capital Vs. State</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 4.1 Trichotomous Levels of All Variables for India and Thailand in 2013 in preliminary study

The levels of each of these variables in the two economies are reassessed with more precise data in this chapter, which also serves as a rationale for structured, focus comparison applied in this study. The results show that India and Thailand adopted an even more similar level of strategic oil supply measures in the years leading up to 2013. They also had a remarkably similar OV level. The overall strength of private capital in Thailand, however, appears to be stronger than that is suggested in the preliminary study, but not to the point of moving up one trichotomous level. The small difference in their overall trust in oil markets holds, and their overall capabilities to implement strategic oil supply measures also remain very similar. The cases of India and Thailand in 2013 reaffirm the validity of the cross-case dimension of H1, as formulated in Chapter 2. The similarity of their DV levels can be explained by the similarity of the levels of the four nominated explanatory variables.

2.1 **Strategic Oil Supply Measures Adopted by India and Thailand**

Two more strategic oil supply measures are taken into account in this chapter in addition to the two that make up the strategic oil supply indicator in Chapter Three. The first one is international oil supply investments engaged in (or not) by Indian and Thai NOCs in
2013. The second one is how much relative preference was given to NOCs in the E&P of indigenous oil resources. Overall, the levels of strategic oil supply measures adopted by India and Thailand in and around 2013 remain very similar after factoring in these two additional measures.

2.1.1 India and Thailand’s International Oil Supply Investments

The government of India continued to encourage its NOCs to “pursue equity oil and gas opportunities overseas” as a way of ensuring oil supply security in 2013 as it had since the 1990s. Up to 2013, India’s central public sector enterprises in the petroleum sectors or NOCs “acquired E&P assets in more than 20 countries” with the total investment “in excess of US$21 billion.” The most prominent of these enterprises was Oil & Natural Gas Corporation Videsh Limited (OVL). It is a wholly-owned subsidiary of Oil & Natural Gas Corporation Limited (ONGC), the largest upstream oil and gas company in India. OVL produced “about 8.357 MMT [million metric tons] of oil and equivalent gas during the year 2013-14 from its assets abroad in Sudan Vietnam, Venezuela, Russia, Syria, Brazil, South Sudan and Colombia.” Expanding into overseas oil E&P projects is also a stated objective of India’s other major NOC, the Indian Oil Corporation Ltd., (IOCL) in 2013. It had 11 overseas E&P blocks in seven countries: the USA, Libya, Gabon, Nigeria, Yemen, Canada, and Venezuela. Not all of these were producing oil, but its share of a

6 Since both economies have prominent NOCs, comparing the extent of these investments is reasonable. Apart from the difficulty of quantifying this particular measure, it is not incorporated in the strategic oil supply indicator in the preliminary study because that would risk pushing the scores of economies that have NOCs unduly high. This is because the measure of government control of crude oil supply already factors in the dominance of NOCs. In addition, some of the economies do not have NOCs, which means they would not have any overseas equity oil E&P projects by NOCs.

7 Again, this is a reasonable measure to compare between India and Thailand, but not among all nine preliminary study economies. Only four of these nine, among them India and Thailand, are known to have dwindling but still worth-producing indigenous oil resources and upstream NOCs.


9 Shebonti Ray Dadwal and Uttam Kumar Sinha, “Equity Oil and India’s Energy Security,” Strategic Analysis, Vol. 29-3 (Jul-Sep 2005), 521. As discussed in Dadwal and Sinha and other studies, this is not to say the Government of India supports each and every proposed overseas equity oil project of its NOCs. I also acknowledge that the Indian government, and especially the NOCs, has goals other than ensuring oil supply security in supporting or implementing such projects. The assumption of the vulnerability-interaction model is still valid as long as securing oil supply is a major goal. For more discussions on this, see the OV (IV) section latter in this chapter.


11 Ibid., 6.


14 IndianOil Annual Report 2013-14, 19.

15 Ibid., 64.

16 Ibid., 9.
project in the USA provided a gross production of about 160,000 barrels of oil.\textsuperscript{17} The smallest of the NOC involving in upstream oil E&P - Oil India Limited (OIL) - was also involved in 14 overseas blocks in eight countries as of 2013.\textsuperscript{18}

Developing international oil supply related projects, including oil E&P, was clearly the intention of both the Thai government and the PTT, the Thai NOC, in 2013. The Department of Mineral Fuels under the Ministry of Energy argues that “accelerated exploration and development not only of Thailand’s concession area but also of the Malaysia-Thailand Joint Development Area” would be one way to secure energy supply.\textsuperscript{19} Regarding its upstream business, PTT indicates its “mission is to seek and secure competitively priced crude oil and natural gas to ensure Thailand’s energy security” by operating domestic and international petroleum E&P and investing in “associated businesses.”\textsuperscript{20} PTTEP, the upstream subsidiary of PTT and its partners, operated 42 projects in 10 countries in 2013, including Myanmar, Algeria, Kenya, and Australia.\textsuperscript{21} While many of these projects had not reached the production phase or did not produce crude oil, the average output of PTTEP’s 16-1 project in Vietnam in 2013 included 43,700 barrels per day (b/d) of crude. The PTTEP Australasia’s Montara project in the Timor Sea began producing 10,000 b/d starting June 2013.\textsuperscript{22}

No information has been found by this author on the investment amount PTT and its subsidiaries have made in overseas oil and gas E&P. PTT’s oil production from such projects is likely somewhat higher than the two projects listed in the last paragraph, but probably would not be thousands of times higher as would be required to match India’s figures.\textsuperscript{23} In view of the long lead time from formulation to actual implementation of many strategic oil supply measures, however, it is contended here that it is reasonable to also include an international oil supply project actualised not too long after 2013. In June 2015, PTT signed an oil-for-loans agreement with Ecuador’s NOC, Petroecuador, to supply it with 116.6 million barrels of oil for “an up-front payment of 2.5 billion.”\textsuperscript{24} No known comparable

\textsuperscript{17} The “participating interest” of IOCL in the Niobrara shale asset in the U.S. provided the “first ever revenue earnings from its E&P business.” Ibid., 64.
\textsuperscript{18} Oil India Limited Annual Report 2012-13, 28. OIL was a joint venture partner in all these projects. IOCL was also partners to 12 of the 14 projects. Ibid., 29-30.
\textsuperscript{19} [Thai] Department of Mineral Fuels under the Ministry of Energy Annual Report 2013, 6.
\textsuperscript{20} PTT Public Company Limited Annual Report 2013, 45.
\textsuperscript{21} Ibid., 68 - 69.
\textsuperscript{22} Ibid., 70.
\textsuperscript{23} 53,000 b/d equal to a little over 1,078 metric tons a year. Even if only half of OVL’s overseas production in 2013 is actually crude oil, it would be almost 3,000 times higher than 1,078 metric tons. For the barrels oil per day to metric ton per year conversion rate, see BP Statistical Review of World Energy June 2014, 44.
deal with oil-producing states or their NOCs are known to be carried out by Indian NOCs during the same period. If the oil acquired through Thai-Ecuador deal is included, the amount of overseas oil acquired by the PTT and its subsidiaries would still be lower, but much closer to the amount acquired by Indian NOCs. After including this deal, the amount of oil either directly developed by NOCs or obtained through oil-for-loan programs overseas by India and Thailand was proportionally similar to their respective economies’ total oil consumption around 2013.

2.1.2 Preference to NOCs for Indigenous Oil Development in India and Thailand

The second additional strategic oil supply measure taken into consideration in this paired comparison is the preference given to NOCs in developing indigenous oil resources. This measure is apt to be compared between India and Thailand at this stage since they, together with China and Indonesia, are the only four economies in this study’s preliminary survey of data that are known to still have substantial levels of indigenous oil resources. In addition, India and Thailand’s oil self-sufficiency rates as of 2013 were relatively similar.

Domestic oil E&P in India has been governed by the new exploration licensing policy (NELP) since 1999. NELP effectively ended five decades of state monopoly in oil E&P activities as both private and public entities and even 100% foreign-owned companies are now allowed to engage in open bidding for the right to explore and develop oil in India.

PTT EP also signed oil and gas E&P agreements with companies in Brazil and Myanmar in 2014, but it appears that oil has not been produced from these projects yet. For details of these agreements, see Henry K.H. Wang, *Energy Markets in Emerging Economies – Strategies for Growth* (Oxford: Taylor & Francis, 2016), 198-199.

OIL did provide a $35 million loan to the private Dublin-headquartered oil firm PetroNeft to finance its project in Siberia in early 2016. However, it is asserted in this study that both the recipient of the loan and the timing (and scale) of the funding (for an exploration and development project in 2016 and 2017) make this incident not comparable to the Thai-Ecuador deal. For a report on the loan, see Charlie Taylor, “PetroNeft says first tranche of Oil India loan executed,” *The Irish Times*, 23 March 2016, accessed 1 August 2016, http://www.irishtimes.com/business/energy-and-resources/petroneft-says-first-tranche-of-oil-india-loan-executed-1.2584165.

The term of this deal appears to stretch for five years (ibid.), which makes the yearly amount of oil supplied slightly less than 3.2 MMT per year (using the conversion rate in the *BP Statistical Review* referenced in footnote 23).

If we use the 8.357 MMT produced by OVL as the base and round it up to 9 MMT as the total overseas equity oil produced by Indian NOCs in 2013, it would equal to about 5.1% of India’s total oil consumption that year. If we use 3.2 MMT (the yearly supply from the Thai-Ecuador oil-for-loans deal) as the base and round it up to 3.3 MMT, Thailand total overseas equity oil “produced” around 2013 would be about 6.5% of the economy’s total consumption (calculated with 2013’s consumption figure).

Using the data in the *BP Statistical Review of World Energy June 2014* to do the calculation, India’s was 23.94% and Thailand’s was 33.78%.

While the policy’s role in achieving the goal of accelerating and more efficiently developing India’s hydrocarbon resources is open to debate, at least on a legal basis, no preference was given to NOCs in the bidding process, especially after the sixth round of NELP bidding in 2006.

Since 2007, the E&P of domestic hydrocarbon resources in Thailand has been governed by the Petroleum Act and the Petroleum Income Tax Act No. 6 under what is called the Thailand III terms. Under these new procedures, qualified foreign as well as Thai limited companies may be awarded indigenous oil E&P concessions. All applications were also partially graded by the provision of “scholarships, training, contributions to support petroleum development in Thailand….” The seemingly more restrictive new rules announced in relation to the latest concession rights bidding round in October 2014 were met with legal challenges. This led to the cancellation of the bidding in 2015. Besides, the changes were made beyond the temporal scope of this study and so are not considered here.

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30 Ibid, 176. Also see Hydrocarbon Exploration and Production Activities, India 2012-13 (Directorate General of Hydrocarbons Under Ministry of Petroleum & Natural Gas, Govt. of India), 6.
32 According to Azhar’s study quoted above, the indigenous hydrocarbon E&P evaluation system before the sixth round of bidding under the NELP in 2006 was unduly, if unintentionally, favoring NOCs due to the weightings of the selection criteria. But the weighting and the system itself have been drastically changed since the sixth round and apparently the playing field has been leveled for both state and private bidders. In addition, after the ninth round of NELP bids were awarded in 2011, the Indian government has been moving towards a new system labeled the Open Acreage Licensing Policy that is more efficient and transparent. See Azhar, 181-183. For details on the evolution of the terms and conditions of the NELP rounds and their chronology, see Hydrocarbon Exploration and Production Activities, India 2012-13, 63.
34 Ibid., 5.
35 The rule that is more pertinent to this discussion stipulates that “[a]fter discovery, a right by a Thai company (owned more than 50% by Thai nationals) approved by the Petroleum Committee, to farm in for not less than 5% undivided participating interest…” Ibid., 6. In June 2016, amended laws that enable the change of rules were passed by the Thai legislature, which will change the existing concession system to the more widely practiced profit sharing agreement system (as in India) and also the service contract system (as in the Philippines). See Aekarach Sattaburuth, “Petroleum bills pass amid opposition,” The Bangkok Post, 25 June 2016, accessed 10 August 2016, http://www.bangkokpost.com/business/news/1019297/petroleum-bills-pass-amid-opposition. Also see David Beckstead, “Potential Amendments to Thailand’s Petroleum Act,” The Bangkok Post, Corporate Counsellor Column, 22 July 2016, accessed 10 August 2016, http://www.tilleke.com/resources/potential-amendments-thailands-petroleum-act.
On the surface, therefore, the Thai as well as the Indian governments did not assign any preference to their NOCs in bidding for indigenous oil E&P in 2013 or the years immediately before or afterwards. Below the surface, however, the playing fields were not as level as they looked and also not level to the same degree. First, both states reserved the right to keep indigenous resources home regardless if state or private companies developed them. The Indian Ministry of Petroleum and Natural Gas (MPNG) stipulated that until India becomes totally self-sufficient in crude oil, all companies must sell the crude they developed in India in the domestic market, even if this might not be strictly enforced. The Thai Petroleum Act, by contrast, allowed much greater leeway for the export of the crude developed in Thailand. The Thai Minister of Energy was only empowered to “temporarily” prohibit crude export “to ensure an adequate supply of petroleum to meet domestic demand.”

Second, although the prices of crude oil were not controlled, the prices of oil products were not allowed to float totally freely in the domestic markets in either economy, which indirectly affected private oil firms’ profit calculation. This was especially true in India. As of 2013, the price of kerosene, domestic LPG, and diesel were still subsidised by the Indian government, while the price of petrol was only decontrolled in 2010. Thailand’s policies have been more market-conforming in both cases and so should be understood as adopting a slightly lower level of the strategic oil supply measure of providing preference for NOCs in developing indigenous oil resources. To sum up, the levels of strategic oil supply measures adopted by India and Thailand remain very similar after examining both additional measures in this sub-section.

36 See Article 18.1, Model Production Sharing Contract, Ninth Offer of Blocks, MPNG, Government of India 2010, 46. Companies may apply for export licenses on a case by case basis with special conditions attached.


38 The subsidies the Indian government paid to NOCs, known as under-recoveries, made it difficult for private firms to market the oil they developed since they are not entitled to such subsidies. The price of diesel was finally decontrolled at the end of 2014, which suggests the playing field is slowly getting more level even in India. See Pravin Kumar Agarwal and Anmol Soni, Petroleum Product Pricing Reforms in India: Are We on the Right Track? The Energy and Resources Institute Policy Brief, March 2013; R. Jai Krishna, “Reliance Petrol Stations Are Back in Business in India,” The Wall Street Journal, 21 May 2015, accessed 15 August 2016, http://www.wsj.com/articles/reliance-petrol-stations-are-back-in-business-in-india-1432210861.

39 The oil product price subsidy in Thailand takes the form of levying taxes on oil products to fill the oil fund to cushion the impact of high oil price since 1991 (at least that is the original intention of the policy). The pricing of crude oil has largely followed the price of the international oil market. For discussion on the functioning of the oil fund, see Thiraphong Vikitset, The Role of Oil Fund in Thailand: Past, Present, and Future - Final Report Submitted to the Research Promotion Committee, National Institute of Development Administration, July 2013.
2.2 Oil Vulnerabilities of India and Thailand

One oil market risk and one supply risk not considered in the plausibility probe are examined in this study to provide a more comprehensive understanding of the overall OV of India and Thailand around 2013. The additional market risk is the oil intensity of their respective economies. In this chapter, “oil intensity” is calculated as to how much gross domestic product (GDP) per ton of oil generates.\(^ {40}\) Using this method of calculation, India’s oil intensity in 2013 was 0.027 while Thailand’s was 0.050. This means the Thai economy was more than 85% more vulnerable to oil price fluctuations that year if only this measure of comparison is used.\(^ {41}\) Thailand, therefore, would be more vulnerable to oil price fluctuations that year if only this measure of comparison is used. Regardless of the causes of the difference in the oil intensities of these economies, the fact remains that the higher that intensity, the more adversely affected the economy would be by fluctuations in oil prices.

The additional oil supply risk examined here is the concentration of the sources of oil supply to India and Thailand and the overall risks associated with the concentration. A modified Herfindahl-Hirschman Index (HHI), weighted with the comprehensive risk of individual supplying countries, is developed to calculate the overall oil supply risks.\(^ {42}\) Therefore, the economy scoring higher on this index would have a higher concentration of oil suppliers and hence a higher overall oil supply risk.\(^ {43}\) India scored 87.24 while Thailand 68.94 on this index in 2013. Therefore, India has a 26.54% higher oil supply risk by this measure alone.\(^ {44}\)

\(^ {42}\) This indicator is roughly modelled after the one developed by Eshita Gupta in her 2008 study. For a discussion of how she calculates this indicator, see “Oil Vulnerability Index of Oil-Importing Countries,” *Energy Policy* 36 (2008): 1198-1200. The political risks in this study are also derived from the comprehensive risk rating in the Country Risk Guide produced by the PRS Group, but instead of regional risks, the risks associated with individual oil supplying countries are used here. This would differentiate high-risk countries such as Iran and Sudan, from OPEC and Africa respectively in general.

\(^ {44}\) For details of the calculation of these scores, see Tables 10 and 11 in Appendix C.
India and Thailand’s. This remarkable similarity continues after two more risk factors are taken into consideration in this sub-section. India’s lower oil intensity is to an extent offset by the higher risk associated with its oil supply sources versus those of Thailand.

2.3 **Strength of Private Capital in India and Thailand**

In this paired comparison the historical-institutional source and the actor specific source that are hypothesised to contribute to the overall strength of private capital versus that of the state are disaggregated. Doing so would provide a clearer picture of the different origins of that overall strength as well as a more targeted understanding of where the domestic-international-state-capital equilibrium lies, specifically in the petroleum sectors. This equilibrium at once contributes to and is impacted by the overall strength of private capital in the entire economy.

The combined scores of the two economic freedom indicators used in the preliminary assessment of this study to gauge the strength of private capital in the economy as a whole are only used to represent the historical-institutional source of it here. No new data are added as these indicators have already taken into consideration a wide array of pertinent institutional factors.\(^{45}\) India’s combined average 2013 score is slightly lower at 60.9 than Thailand’s 64.6.

The actor-specific source of India and Thailand’s private capital strength in their petroleum sectors is examined in this chapter to have a more complete picture of the where the private-state capital balance lies in their overall economies as of 2013. After this more targeted source is factored in, private capital appeared to be even stronger in Thailand in 2013 than the result of the single-source preliminary study suggests. This greater strength, however, does not amount to an upgrade in Thailand’s trichotomous ranking of the overall strength of private capital versus that of the state.

The framework with the four scenarios describing the domestic-international-capital-state balance laid out in Chapter Two is applied in this chapter. The same graphic representation of this framework is reproduced below for easy reference:

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\(^{45}\) The Index of Economic Freedom, for examples, examines the rule of law, government size, regulatory efficiency, and market openness of each economy, with a number of components making up these four major areas of investigation. See “Methodology – 2016 Index of Economic Freedom,” The Heritage Foundation website, accessed 20 December 2016, [http://www.heritage.org/index/book/methodology](http://www.heritage.org/index/book/methodology). The Economic Freedom of the World index examines the size of government, legal system and property rights, “sound money,” such as the “freedom to own foreign currency bank accounts,” and freedom to trade internationally of each economy. Again, a number of components make up these four categories. See “Approach – Economic Freedom,” the Fraser Institute website, accessed 20 December 2016, [https://www.fraserinstitute.org/economic-freedom/approach](https://www.fraserinstitute.org/economic-freedom/approach).
Figure 4.2  Actor-specific component correlation with DV, depicted as domestic capital’s relationship vis-à-vis strength of international capital and SOEs

<table>
<thead>
<tr>
<th>SOEs</th>
<th>International Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stronger</td>
</tr>
<tr>
<td>Stronger</td>
<td>Negative Scenario 1</td>
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<tr>
<td>Weaker</td>
<td>Negative but empirically improbable Scenario 3</td>
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2.3.1 International-Domestic-Capital-SOE Balance in Indian Petroleum Sectors

The Indian petroleum sector as a whole was dominated by IOCs in the first decade or so after independence, but by the 1970s, the situation was almost completely reversed.46 The low efficiency of NOCs and other exogenous factors led to gradual liberalisation of the sector beginning in the 1980s, which cumulated to the adoption of the NELP in the upstream sector in 1999.47 Since then, private firm - even 100% foreign-owned oil firms - have been allowed to bid for indigenous oil E&P projects. In fact, the petroleum sector has been placing somewhere between the 9th and the 11th largest foreign-investment-receiving sector in India in recent years.48 This only translates into a little less than 3% of the total FDI inflow, but was already higher than that for the Indian economy as a whole. The five-year average of the overall inbound FDI between 2009 and 2013 accounted for 1.8% of India’s GDP of the same period.49 For example, Cairn UK Holding, via its subsidiary Cairn India, made the second largest greenfield foreign investment project in value in India during the period

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48 The petroleum sector ranks the 9th for total accumulative FDI up to December 2010 and the 11th up to December 2013. See “Fact Sheet on Foreign Direct Investment From August 1991 to December 2010,” (p2) and “Fact Sheet on Foreign Direct Investment From April 2000 to January 2013,” (p 8), Department of Industrial Policy & Promotion, Government of India, accessed 5 September 2016, http://dipp.nic.in/English/Publications/FDI_Statistics/FDI_Statistics.aspx.
49 The data available does not specify whether it is referring to the upstream, midstream, or downstream petroleum sector, but in the case of India at least, judging by the existing configuration of the petroleum sector as a whole, international capital mostly only invests in the upstream sector.
between June 2006 and September 2009. Yet, major international oil companies such as Exxon, Shell, and Chevron have never participated in any of the NELP bidding to develop indigenous hydrocarbon resources, and the domestic upstream oil sector is a near duopoly between the major NOC ONGC and the domestic private firm Reliance.

Private oil firms, including international ones, have been present in the India’s mid- and downstream oil sectors, but their manoeuvring room in the domestic market was limited by the less than totally freely floating product prices in the decade leading to 2013. These firms, such as Reliance, Essar Oil, and Shell chose to “focus on either the lucrative export market or remain inactive in the absence of a level playing field.” Reliance, for example, was granted a 100% export-oriented unit status by the Indian government in 2007 to export the crude it developed in India provided that it “balanced its total imports and exports.”

In the petroleum sectors, domestic private capital was stronger than international capital in India’s domestic markets. Domestic oil firms, regardless of the source of their capital, however, were still far weaker than multinational corporations. For example, the biggest company by revenue in India according to the “Fortune India” 2013 list, the NOC IOCL, ranked 88th on the Fortune Global 500 2013 list. IOCL made just over 3% of the profits made by the company topping the list, which happened to be also an oil company, Royal Dutch Shell. The second, third, and fourth biggest companies in India that year according to this list were almost all oil firms, but they were smaller in size: Reliance Industries Limited, ranking 107th, Bharat Petroleum (NOC), ranking 229th; and Hindustan petroleum (NOC), ranking 260th. The gaps of the absolute strengths between Indian corporations and international corporations in other sectors appear to be also very great. For example, the largest automobile manufacturer in India, Tata Motors, made less than 9% of the profits of Volkswagen, the world’s top-ranking automobile manufacturer in 2013.  

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51 Azhar, 184.
55 Ibid.
56 Ibid. According to the measure of market capitalization, however, Reliance was listed as a stronger energy company (ranking 25 in 2013 and 21 in 2012) than ONGC, the only other Indian energy firm on the list (ranking 30 in 2013 and 25 in 2012). See “IHS Energy 50 – The Definitive Annual Ranking of the World’s Largest Listed Energy Firms, January 2014.”
57 These are according to the Forbes Global 2000 2013 list, which “uses an equal weighting of sales, profits, assets and market value to rank companies.” Accessed 9 September 2016, http://www.economywatch.com/companies/forbes-list.
Domestic private oil firms were definitely still in a weaker position than public enterprises in all sectors of India’s oil supply chain as of 2013, more so than in the overall economy. In the upstream sector, up to the eighth round of NELP bidding in 2010, “ONGC held 57 per cent, RIL [Reliance] held 30 per cent and others, more than 50 companies, held just 13 per cent of the total NELP acreage.” 58 The slow pace of oil product decontrol and the related complex under-recovery policies render the downstream sector still totally the domain of public enterprises. 59

To sum up, domestic private capital in the petroleum sectors of India was weaker than international capital in absolute terms and also weaker than NOCs by 2013. This puts the actor-specific source of the India’s domestic private capital vis-à-vis those of international and state capital in the third scenario or the bottom right quadrant of Figure 4.2 above.

2.3.2 International-Domestic-Capital-SOE Balance in Thai Petroleum Sectors

Foreign investments have long been a major funding source in Thailand’s petroleum sectors, much more so than in the overall Thai economy. 60 In particular, “Chevron is the largest oil producer in Thailand, accounting for nearly 70 per cent of Thailand’s crude oil and condensate productions.” 61 It is also the majority owner of a major refining facility, 62 and its Caltex brand operates about one-third of service stations in the country. 63 In addition, a variety of other foreign-capital funded oil firms were awarded oil concessions in Thailand in the few years before 2013. 64

58 Azhar, 184.
60 The five-year (2009-2013) average inbound FDI in the overall Thai economy is 2.86% of its GDP. This is calculated with the same World Bank data as in India. See footnote 49 above.
61 Wang, 198.
64 Some examples include: Carnarvon Petroleum Limited (Australian-based) and Shaanxi Yanchang Petroleum (Group) (owned by the Shaanxi provincial government in China). See [Thai] Department of Mineral Fuels under the Ministry of Energy Annual Report 2013, 39.
As in India, domestic private corporations in Thailand were certainly weaker than international capital in absolute terms, even if they might be stronger in the domestic market in some sectors, such as banking and agribusiness. No Thai corporation was on the 2013 Global Fortune 500 list. The top ranking Thai corporation on the 2013 Forbes Global 2000 list was the NOC PTT PCL, and the profits it made was 7.57% of those made by the top oil firm on the same list, Exxon Mobil. The second largest Thai corporation on the list was the privately-owned Siam Commercial Bank (SCB). The profits it made were only 3.44% those of the bank topping the same list, the ICBC Bank of China.

In the petroleum sector as a whole, NOCs were definitely stronger than domestic private corporations in Thailand up to 2013. PTT’s monopoly in natural gas purchasing, wholesaling, and distributing in the domestic market make its overall position formidable even if it did not enjoy the same monopoly regarding crude oil or oil products. With the existing dominance of IOCs and NOCs in the oil sectors, there has not been much room left for domestic capital to participate in them, except through owning shares of PTT or its subsidiaries and affiliates.

After examining the strength of domestic capital versus that of SOEs in Thailand’s overall economy and the oil supply sectors above, the conclusion is that the actor-specific source of Thailand’s domestic capital fits in the same bottom right quadrant of Figure 4.2 as in India. Thai domestic private capital was no doubt weaker than international capital in absolute terms. It was also much weaker than state capital as of 2013. This means that in Thailand as well as in India, the effect of the actor-specific source on the overall strength of private capital is neutral. Its effect on the level of strategic oil supply measures adopted, therefore, hinges on the state’s orientation.

The vulnerability-interaction model hypothesised that the state’s orientation in the oil supply sectors is predicated on the economy’s OV and decision-makers’ trust in the oil markets. Thailand’s slighter higher trust in the oil markets, as further explored in the next section, may have contributed to its relatively more liberalised petroleum sector governance and stronger positions of IOCs in Thailand in the decade leading to 2013. The greater historical-institutional support private capital in Thailand received as suggested by its slightly higher combined average overall economic freedom score would further bolster the

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66 Ibid.


68 Tordo et al, 97.
overall strength of private capital in Thailand. All these differences, however, are still relatively small and would not amount to an upgrade of this ITV to a higher trichotomous level.

2.4 India and Thailand’s Overall Trust in Oil Markets

This section examines each component the vulnerability-interaction model proposes to make up decision-makers’ overall trust level in oil markets’ ability to ensure oil supply security in greater details in the cases of India and Thailand. The more cursory data examined in the plausibility probe of this thesis result in these two economies receiving the same trichotomous overall trust level. Based on analyses of annual report contents of pertinent NOCs and supported by facts related to the domestic and external contexts hypothesised to facilitate securitising, the conclusion is that the levels of these component parts accurately reflect the situations in each economy. Their overall levels of trust in the oil markets, therefore, should be similar, with Thailand’s a little higher than India’s. Thailand’s more liberalised, but not totally free, domestic oil market governance is concordant with this finding.

2.4.1 Securitising Agents

In Chapter Three, both India and Thailand received the lowest trichotomous score for the securitising agent component, which is hypothesised to lead to the lowest level of trust in oil markets. This is based on the fact that the two economies each had at least one “traditional” NOC. In this comparative study, the relative coherence of these NOCs as securitising or lobbying agents and evidence of their securitising attempts are examined to ascertain if they are similar.

Unlike Thailand, India does not have a single vertically integrated NOC, but five central-level NOCs operating at different oil sectors.69 This, however, does not necessarily mean that their collective coherence as securitising or powerful lobbying agents would be lower than Thailand’s PTT. To investigate this further, and indeed, to see if there is actual evidence that NOCs routinely try to play up their importance in ensuring the oil supply security to the economy, a content analysis is offered here of annual reports of relevant NOCs in the five years leading to 2013.70

The results of the analysis indicate that NOCs in both countries trumpeted the various important roles they play to ensure oil supply security to their respective economies

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69 This excludes the Gas Authority of India Limited which is not related to crude oil supply. For the five Indian NOCs that do, see pages 47 and 48 in Chapter Three.

70 The annual reports of years 2009 to 2013 are analysed when they are available (PTT). In cases when one of these years are not available (ONGC), those of earlier years are analysed. The earliest one examined is the ONGC 2007-08 Annual Report.
to comparable degrees overall.\textsuperscript{71} There are, however, noticeable difference in emphasis. Indian NOCs highlight their effort in ensuring oil supply and other basic services to India’s largely resource-deficient population in rural areas of the country, while Thailand’s PTT focused more on its pivotal role in ensuring oil supply security to the economy as a whole and as a “national champion” company. In addition, the securitising or lobbying effort as manifested in the language used in the annual reports of both countries’ NOCs appears to trend upward towards 2013.\textsuperscript{72}

For India, the annual reports of ONGC and IOCL, representing the largest upstream and mid- to downstream respectively, are examined. To gauge their overall securitising effort, each appearance of the terms “strategic” and “security” is assigned the score of zero, one or two. The score of zero is assigned to applications not related to securitising. In the case of the word “strategic,” a positive score is only assigned when it conveys meaning beyond being long-term and/or well-planned commonly used in commercial settings. The following applications, for example, receives the score of “two”: “The task [satisfying large projected increase in energy demand] is huge for Indian companies and even more significant for your company, ONGC being the flagship company of this highly strategic and nationally critical sector.”\textsuperscript{73}

The score of “one” is assigned when the meaning of the language used is more ambiguous. For the word “security,” a positive score is only assigned when it is used to highlight the company’s importance in ensuring oil or energy security to the country. The following usage only receives a “one” because of its multifaceted message: “Apart from our mission as the national oil company which is ensuring energy security by supply[ing] the energy to the country’s demand, our responsibility as a corporate enterprise registered in the Stock Exchange of Thailand also include enhancing economic prosperity by delivering high income to the state.”\textsuperscript{74} The following two unequivocal usages, however, each receives the score of “two”: “With our footprint in 16 countries, we are geared to anchor India’s energy security”\textsuperscript{75} and “The mission is to seek and secure competitively priced crude oil and natural gas to ensure Thailand’s energy security.”\textsuperscript{76}

The combined five-year average score of ONGC and IOCL for this general securitising agent category was 10.2 versus PTT’s 26. This was due to PTT’s very liberal

\textsuperscript{71} Thailand’s PTT receives a five-year average overall securitising score of 34.8 while India’s ONGC and IOCL (see explanation in the next paragraph) together receive a five-year average overall score of 37.2.

\textsuperscript{72} The total score spikes in 2011 for the PTT as that report has an unusually frequent mentioning of the company’s effort to supply oil and other basic services to people affected by the great flood that devastated the economy, especially in the rural area, that year.

\textsuperscript{73} ONGC 2013-14 Annual Report, 109.

\textsuperscript{74} PTT Annual Report 2013, 16.

\textsuperscript{75} ONGC 2013-14 Annual Report, inside cover.

\textsuperscript{76} PTT Annual Report, 2013, 45.
use of the term “energy security” while emphasising its role in achieving it on behalf of the Thai nation. By contrast, the term “strategic” did not appear even once in all five years of PTT’s annual reports. Indian NOCs also mentioned their role in ensuring Indian’s energy security, but not as frequently. ONGC, India’s upstream leader, occasionally mentioned the strategic role it played as the quotation above demonstrates. The main downstream NOC, however, did not do so as it only recently began to engage in overseas upstream oil projects, which are seen as “strategic” in popular imagination.

One possible explanation of PTT being apparently a more enthusiastic securitising/lobbying agent is that it faced greater competition from IOCs in the domestic market than its Indian counterparts. At the same time, Thailand’s oil product pricing regime was more liberalised in 2013, hence it was more difficult for PTT to highlight its role of catering for the needs of the poor. The combination of a greater need to justify its continued existence and the constraint the Thai oil pricing regime placed on its securitising option could well have resulted in more effort being put on trumpeting its mission of ensuring the country’s energy security.

None of the Thai or Indian NOCs analysed directly or explicitly links its raison d’être with military or geopolitical rationales. This does not, however, mean that they did not act or serve as securitising or powerful lobbying agents for their continued existence and expansion, as the examples quoted above demonstrate. The intention behind the relatively frequent usage of the terms analysed in pertinent ways is made even clearer if we compare the NOC results to those of Exxon Mobil. It scores zero for all three years the analysis is conducted on the same two terms. The contrast is less stark, but the result for Reliance Industries, the major Indian-based private oil firm, still shows a lower level of emphasising the concepts of “strategy” and/or “security.” In short, despite the difference in emphases, as further illustrated in the next sub-section, India and Thailand both deserve the same trichotomous score for their NOCs serving as strong and coherent securitising agents.

2.4.2 Domestic Context

Before delving into NOCs’ securitising effort related to entrusting oil supply and distribution within the economy entirely to private firms, I will examine more closely the

77 Thailand’s oil fund “subsidy” system is supposed to stabilise oil product prices, not directly lowering prices to make them more affordable to the poor population. See footnote 39 above for more discussions.

78 For 2013, 2010, and 2009. A typical example of the its usage of the term “strategic” reads like this: “Our additions come from a combination of the development of new fields, extensions to existing fields driven by further development, effective reservoir management, and application of new technologies, as well as strategic acquisitions.”

79 Reliance Industries’ 2013-14, 2012-13, and 2009-10 annual reports are analysed. The three-year average of their usages of these two terms is 8.67 versus the ONGC and IOCL’s combined score of 10.2.
facts on India and Thailand’s evenness and levels of economic development, and the social context that would make such effort more persuasive if the conditions are relevant enough as described in Chapter Two.

Thailand was noticeably more urbanised and “well off” on a per capita basis than India in 2013 according to the data collected in the preliminary analysis in Chapter Three. By these two measures, the objective domestic context should allow decision-makers in Thailand to have fewer worries about trusting an unfettered domestic market or relying solely on private oil firms to ensure oil supply security. This in turn would also make persuasive securitising by PTT with this domestic context more difficult according to the logic of the vulnerability-interaction model.

Per capita GDP, however, only shows the mean income of the population in an economy. Knowing how evenly the income is distributed among the population would provide a more accurate picture of the magnitude of poverty in the economy, which is more relevant to decision-makers’ level of trust as hypothesised by the vulnerability-interaction model. The income distribution of India appears to be more even than that in Thailand around 2013 according to the measure of the GINI index. At the same time, the difference between the two economies’ five-year average per capita GDP between 2009 to 2013 is more or less the same as that of 2013 alone: Thailand’s was almost exactly three times that of India’s. These two facts taken together would mean that even though there were real differences in India and Thailand’s urbanisation and prosperity levels, the gap in decision-makers’ trust in the domestic market in the two economies would in fact be a little smaller.

Returning to the content analysis of the annual reports of Indian and Thai NOCs, three groups of words are used to verify if these NOCs emphasise their importance in serving the rural and needy population that tend to be underserved by private firms. The results corroborate with the different objective domestic contexts of these two economies as

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80 Its urban population was 48% versus India’s 32% and its per capital GDP was $15,437 versus India’s $5,268. Data sources of these are from the World Bank website. See Section 2.4.2 in Chapter Three for details.


82 The degrees of urbanization in the decade leading to 2013 have risen steadily in both economies and so offers no further insight than that offered by the snapshot results of 2013.
discussed in the last paragraph. Indian NOCs, serving a less prosperous and more rural economy, highlighted their domestic distributive role much more forcefully than PTT. If we only focus on the group of words “poor, remote, or rural,” the difference in the five-year average scores of the two economies is stunning: India’s was 21 and Thailand’s was 0.8. A typical usage of these terms by Indian NOCs reads like this: “… Indian Oil bagged the Asia Retail Congress Award for Retail Excellence for the ‘Rural Impact’ category for its innovative rural initiative… special format petrol/diesel stations in rural areas.”

Interestingly, the PTT used the second group of words more frequently. It scored a five-year average of 4.4 versus Indian NOCs’ combined total of 3 for the words “(self)-sufficient/sufficiency/reliant/reliance.” This may be impacted by the philosophy of self-sufficiency preached by the popular late Thai monarch. A positive score is assigned to the application of the third term analysed, “serve,” when it emphasised the NOCs’ role in serving the underserved or the national interest as a whole. In this category, both countries’ NOCs scored very similarly: India’s 3 versus Thailand’s 3.6 (five-year average).

In sum, India scored more than three times higher in the combined results of these three categories of words related to the domestic context of securitising, 27 versus Thailand’s 8.8 (five-year average). In addition to reflecting the greater pertinence of India’s objective environment to securitising in the domestic context as hypothesised by the proposed model, the results illustrate Indian NOCs’ eagerness, at least the downstream ones, to defend their “territory” by securitising. During the period studied, Indian downstream NOCs only shared a fraction of the costs related to maintaining the artificially low petroleum product prices called “under-recoveries.” In return, they gained an edge over private oil firms as these firms received little or no under-recoveries from the state as compensation. The upstream leader ONGC, which did not enjoy such an advantage but had to share the burden of the costs, actually displayed even a lower overall domestic context score than PTT. ONGC, however, did attain a score more than three times higher than PTT’s for the

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83 Indian Oil Corporation Annual Report 2011-12, 48.
85 For a discussion of under-recoveries and how the fiscal burden of them were shared, see Agarwal and Soni, Petroleum Product Pricing Reforms in India, 1-3. The burden borne by downstream NOCs appear to be getting larger over the years, but still less than a third of the total subsidies. See Petroleum Prices, Taxation and Subsidies in India (Paris: International Energy Agency, 2009), 6-10.
87 ONGC’s five-year average of overall domestic context score is 3.6 versus PTT’s 8.8 and IOCL’s 23.4.
group of words “poor, remote, or rural,” which in turn was only about one seventh of its downstream counterpart in India.  

India’s lower trust score in the domestic oil market in the plausibility probe remains accurate after a more detailed examination of the evenness and level of economic development of India and Thailand as well as the securitising efforts of their NOCs in the domestic context. As suggested by the vulnerability-interaction model, Thailand did seem to trust the functioning of the domestic oil market more than India in the years leading to 2013. It had a much more market-confirming domestic oil product price regime as it did not artificially set the prices of oil products.

2.4.3 External Securitising Context

India and Thailand both received the middle score for their level of trust in the international oil markets in the plausibility probe. In that preliminary study, this score was assigned to a polity that was neither a formal or de facto ally nor having a relationship that may be interpreted as “neutral-confictual” with the United States around 2013. The vulnerability-interaction model hypothesises that a negative relationship with the United States would create an external context that can easily be exploited to securitise the untrustworthiness of the international oil markets than one that is close.

The reasoning of the proposed model is based on the fact that the United States has been the hegemonic power of the international political and economic systems for decades. The United States has been the creator and rule and agenda setter in most international organizations, including the one that represents net oil importing advanced economies, the IEA. The United States is also the single country that had the naval power to underwrite the security of or block off sea lanes most oil shipped to Asia have to use.  

U.S.-based corporations, including major IOCs, have been dominant players in the international oil markets. All these objective facts may be manipulated to sow doubts in the fairness of the existing international oil markets by lowering states’ trust in these markets. One way to do so is to play up the zero-sum economic nationalistic worldview, which assumes the United States would try by any means to hang on to its historical dominance. The goal is to bolster its “power, prestige, or the prosperity” at the expense of other nations, especially those having a conflictual relationship with it.

88 ONGC’s five-year average for this group only is 2.6 versus PTT’s 0.8 and IOCL’s 18.4.
90 The quoted phrase was supposed to be the goals of economic nationalists, even if the means adopted to achieve these goals can be very diverse and not necessarily zero-sum in orientation. See Helleiner, “Economic Nationalism as a Challenge to Economic Liberalism?” 310 and footnote 59 in Chapter Two for more discussions.
India and Thailand’s middle score means this external context should not have much salience in securitising oil supply risks directly or indirectly related to the United States. Partly due to this lack of salience and partly due to the unlikelihood of discussions of the state’s bilateral relationships with the hegemonic power in NOC annual reports, no content analysis on them is conducted.

Instead, in this pairwise comparison, Indian-U.S. and Thai-U.S. relationships are examined more closely to see if they are indeed very similar and if not, whether the difference would likely lead to a notable difference in decision-makers’ level of trust in these two economies concordant with the expectation of the proposed model. Indian-U.S. politico-strategic relations in the decade leading to 2013 improved tremendously compared to during the Cold War, or even the early post-Cold War years. Despite the talk about the two being natural allies in this decade, however, their relationships did not seem to have developed to the level of closeness of actual allies yet as of 2013.

Since the signing of the “New Framework for the US-India Defense Relationship” agreement in June 200591 and the issuance of the joint statement between President George W. Bush and Prime Minister Manmohan Singh a month later,92 many commentators have noted the blossoming relationship between the two countries, especially as a contrast to the Sino-American relationship.93 Other commentators take a generally optimistic, but more neutral, view of the bilateral relationship between New Delhi and Washington. While acknowledging it to be at a historic high, they also call to attention lingering issues such as Indian-Pakistan animosity, India’s continuing arms acquisition from Russia,94 U.S. worries about “strategic autonomy” of India,95 U.S. demands for “Indian allegiance” and a faltering

Indian economy making it a “less attractive strategic partner to the U.S.” Priya Chacko goes further by pointing out that the notions of American exceptionalism and “Indian civilizational exceptionalism” are fundamentally incompatible, which act as a “key barrier” to the two countries developing a truly “special relationship” even at a period of power transition fraught with “ontological insecurity” due to a rising China.

U.S.-Thai relations were heading in the opposite direction during the same timeframe. They continued to trend downward from its height during the Cold War, notwithstanding the temporary boost they received from the common goal of countering terrorism in the years immediately following the 9/11 attacks and the American invasion of Iraq in 2003. The two allies’ respective relationship with China also featured prominently in their relationship with each other, but also roughly having an opposite effect as in the case of Indian-U.S. relationship. In an observer’s words, “differing threat perceptions about China…contribute to a sense that the alliance, while institutionally sound, suffers from a lack of strategic alignment.”

The 2006 military coup that ousted Prime Minister Thaksin Shinawatra and the political instabilities in the years leading to 2013, not to mention the military coup in 2014, have put further strains on the alliance. By the last few years of the first decade of this century, the two Cold War and counter-terrorism allies were on divergent paths again, even if the benefits of the alliance were still too great for either to rush for the exit. One such benefit is the annual Cobra Gold exercise that takes place in Thailand. It is the largest multinational military exercise in the Asia Pacific with the goal of advancing regional security and humanitarian operations. The exercise was only scaled down, but not cancelled even after the 2014 coup. Thailand was chosen as the first stop of President Obama’s first trip.

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97 He explains American exceptionalism as entailing “the notion that American ideals and institutions are universal and that the United States has an obligation to exercise global leadership.” On the other hand, Indian civilization exceptionalism entails seeing “India as a responsible state with a non-coercive, prudent, exemplar-style approach to moral leadership that seeks a better path to modernity.”


99 For a history of that relationship from its height in the Cold War, through the doldrums in the 1990s and its partial “revival” in the early 2000s, see Paul Chambers, “U.S.-Thai Relations after 9/11: A New Era in Cooperation?” Contemporary Southeast Asia 26-3 (December 2004): 460-476.


to Southeast after his re-election to shore up the already sagging relationship, even if his visit to Myanmar received the greatest attention for that trip.102

I argue that the closer examination of India and Thailand’s relationships with the United States in this sub-section so far justifies the middling score they received, although they arrived there from very different starting points. The relationships have also been predicated on very different legal and institutional frameworks and appear to be trending in different directions.

Were these differences large enough to impact on decision-makers’ calculations of the oil supply risks their economies faced around 2013 or did they make securitisation easier by NOCs and other interested parties in one of the countries? My assessment is “no” on both counts. First, as mentioned earlier, a middle score is not hypothesised to have much salience on decision-makers’ trust level in the international oil markets. In addition, improving India-U.S. relations in the last decade would make securitising American response to such developments as the Indian-Iranian oil trade and investment projects more difficult.103 In the case of Thailand, the prominent role played by American oil firms’ in the economy’s oil sectors also makes securitising oil supply with the country’s generally downward relations with United States in the last few decades less relevant.

2.4 Implementation Capabilities of India and Thailand

This section tests the proposition that India and Thailand had a similar level of overall capabilities to implement strategic oil supply measures in 2013. First, an additional implementation capability especially applicable to countries with traditional NOCs is examined with respect to India and Thailand’s situations. Then, the two countries’ diplomatic capability to render support to state intervention in oil supply is re-examined with greater specificity than the nature of their UN memberships, used as the proxy in the plausibility probe.


Taking into account a more in-depth investigation, India and Thailand’s overall capabilities in implementing strategic oil supply measures appear to remain very similar. India appears to be slightly weaker than Thailand in one of the additional capabilities examined. Its NOCs were less profitable than Thailand’s and they also seemed to have less autonomy of how to use the profits. India, however, definitely had a greater capability and indeed more aggressively engaged in oil diplomacy than Thailand during the period studied.

2.4.1 NOC Profitability

The profitability of NOCs is examined here as an additional implementation capability. The logic is that since all central-level NOCs in India and Thailand are publicly traded domestically, to a large degree, they can use their net profits to sustain and expand their operations independent of the financial capabilities of the state. This in turn results in the adoption of higher levels strategic oil supply measures by their host economies as defined in this project. These may include more overseas equity E&P projects or NOCs controlling a higher percentage of the economy’s crude oil supply through either E&P or trading. Both the absolute amount and its ratio relative to the company’s assets or equity are taken into consideration to determine if the NOCs have similar capability in sustaining or expanding themselves with their net profits.

The combined five-year average (2009-2013) of the net profits of India’s five NOCs was a little more than twice that of PTT’s. By this measure, Indian NOCs appeared to be less profitable as the oil consumed in India in 2013 was almost 3.5 times that in Thailand. The same five-year averages of the net profits to equity or net worth ratios of Indian and Thai NOCs were similar. The four-NOC average of India’s was 12.77% versus PTT’s 13.98%. Data for the smaller upstream Indian NOC Oil India Limited is not available and hence is not factored into the calculation. Otherwise, the two ratios would be even closer.

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104 The generally higher ownership stakes the Indian government has in its NOCs than the Thai government on PTT (especially when the 15% owned by the Thai sovereign wealth fund is not counted) partly contributes to this statement. In addition, simply judging by the “NOC Corporate Governance” sections on ONGC and PTT in the World Bank study on NOCs, ONGC has less functional independence than PTT. See Tordo et al, National Oil Companies and Value Creation, Volume II, 29 and 103.

105 There are other regulatory or political restrictions to NOC activities. Different corporate governance structures would also impact on NOCs’ financial autonomy as discussed in the last footnote. Still, everything being equal, the more funds NOCs have in the form of net profits from their operations, the greater capability they would have to maintain and expand their activities.

106 The sources of the information are from the companies’ annual reports. IOCL and Hindustan Petroleum’s annual reports provide the profits in U.S. dollar, as well as in Indian Rupees (INR). The other three companies only provide the amount in INR and Conversion rates to US$ with the corresponding year are used to compute the US$ equivalent for comparison with PTT’s profits, which also need to be converted from Thai Bhat to U.S dollar. See Table A12, Appendix C for details.

107 Indian NOCs’ combined total net profit is US$6352.94 million and PTT’s is US$2,855 million.

as upstream firms appear to be more profitable than downstream ones in India as oil products were still subjected to de facto price control during the period studied.\footnote{The major Indian upstream firm ONGC’s five-year net profits/net worth ratio is 19.8\% while those of the three downstream firms’ ratios are 11.6\%, 11.14\%, and 8.48\%.

\footnote{India’s five-year average GDP (2009-2013) is US\$1,715,400 million and Thailand’s four-year average GDP (2010-2013) is US\$382,178.25 million. See “GDP (current US\$),” The World Bank website. Accessed 20 November 2016, \url{http://data.worldbank.org/indicator/NY.GDP.MKTP.CD}. Only a four-year average is done on Thailand because data on the expenditures of its Ministry of Foreign Affairs are only available from 2010-14. See the next footnote.}

\footnote{To be precise, it is 5.9 times more. The source of the MEA budgets of 2009-2013 is from the [Indian] \textit{Ministry of External Affairs Annual Reports 2013-14}, 203; the sources of the Thai MAF expenditures of 2010-13 are from \textit{Thailand’s Budget in Brief Fiscal Year 2014}, 75, \textit{Thailand’s Budget in Brief Fiscal Year 2012}, 74, and \textit{Thailand’s Budget in Brief Fiscal Year 2011}, 62.}

\footnote{As a comparison, the U.S. State Department and foreign aid budget (including military aid) for 2014 was estimated to be US\$47.8 billion, but US\$35 billion of that was for aids. After deducting that out, the U.S. spent about 0.073\% of its GDP to staff its diplomatic establishments. For the total State Department and USAID budget, see Executive Budget Summary of the United States of America Department of State, Fiscal Year 2014, 2. Accessed 25 February 2017, \url{https://2009-2017.state.gov/documents/organization/207305.pdf}. For the total foreign aid budget, see Nick Thompson, “Seventy-five percent of U.S. foreign military financing goes to two countries,” November 11, 2015 CNN websites. Accessed 25 February 2017, \url{http://edition.cnn.com/2015/11/11/politics/us-foreign-aid-report/}. U.S. GDP data is obtained from the World Bank website, \url{http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=US}.}

\footnote{The recipients of the largest of these loans and advances were not oil producing countries, and hence these loans would not be related to oil diplomacy. See the complete list of recipients for fiscal year 2011-12 on page 209 of the MEA annual report of that year.}

\subsection{2.4.2 Oil Diplomacy Capability of India and Thailand}

Both the size and specialty of a country’s diplomatic establishment are important to carry out effective oil diplomacy. Political negotiations, which are inseparable from oil diplomacy, take time, resources, and skills. In this section, therefore, the specialty of and spending on India and Thailand’s foreign affairs and other pertinent ministries that can support their respective states’ and NOCs’ overseas oil supply activities are examined.

India, with a GDP about four and a half times that of Thailand in the years leading to 2013, is expected to have a much larger diplomatic establishment in absolute terms.\footnote{To be precise, it is 5.9 times more. The source of the MEA budgets of 2009-2013 is from the [Indian] \textit{Ministry of External Affairs Annual Reports 2013-14}, 203; the sources of the Thai MAF expenditures of 2010-13 are from \textit{Thailand’s Budget in Brief Fiscal Year 2014}, 75, \textit{Thailand’s Budget in Brief Fiscal Year 2012}, 74, and \textit{Thailand’s Budget in Brief Fiscal Year 2011}, 62.}

The results of the comparison of the expenditures of the two countries’ respective ministries handling foreign affairs, the Indian Ministry of External Affairs (MEA) and the Thai Ministry of Foreign Affairs (MFA) during the period studied, more than confirm this expectation. The Indian ministry spent almost six times more than its Thai counterpart.\footnote{As a comparison, the U.S. State Department and foreign aid budget (including military aid) for 2014 was estimated to be US\$47.8 billion, but US\$35 billion of that was for aids. After deducting that out, the U.S. spent about 0.073\% of its GDP to staff its diplomatic establishments. For the total State Department and USAID budget, see Executive Budget Summary of the United States of America Department of State, Fiscal Year 2014, 2. Accessed 25 February 2017, \url{https://2009-2017.state.gov/documents/organization/207305.pdf}. For the total foreign aid budget, see Nick Thompson, “Seventy-five percent of U.S. foreign military financing goes to two countries,” November 11, 2015 CNN websites. Accessed 25 February 2017, \url{http://edition.cnn.com/2015/11/11/politics/us-foreign-aid-report/}. U.S. GDP data is obtained from the World Bank website, \url{http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=US}.}

Another way to express this difference is that India spent on average 0.08\% of its GDP to run its MEA while Thailand spent 0.06\% of its GDP to run its MFA.\footnote{As a comparison, the U.S. State Department and foreign aid budget (including military aid) for 2014 was estimated to be US\$47.8 billion, but US\$35 billion of that was for aids. After deducting that out, the U.S. spent about 0.073\% of its GDP to staff its diplomatic establishments. For the total State Department and USAID budget, see Executive Budget Summary of the United States of America Department of State, Fiscal Year 2014, 2. Accessed 25 February 2017, \url{https://2009-2017.state.gov/documents/organization/207305.pdf}. For the total foreign aid budget, see Nick Thompson, “Seventy-five percent of U.S. foreign military financing goes to two countries,” November 11, 2015 CNN websites. Accessed 25 February 2017, \url{http://edition.cnn.com/2015/11/11/politics/us-foreign-aid-report/}. U.S. GDP data is obtained from the World Bank website, \url{http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=US}.}

This study refines these numbers by taking two actions. First, India’s substantial “loans and advances to foreign governments,” about 13\% of the budget of its MEA,\footnote{The recipients of the largest of these loans and advances were not oil producing countries, and hence these loans would not be related to oil diplomacy. See the complete list of recipients for fiscal year 2011-12 on page 209 of the MEA annual report of that year.}is excluded from the calculation. Second, in Thailand, the Department of Mineral Fuels (DMF) under the Ministry of Energy has responsibilities of promoting hydrocarbon E&P in areas
overlapping with neighbouring countries. This and related functions may reasonably be considered the implementation of oil diplomacy in some ways.\textsuperscript{114} Even generously adding half of the DMF expenditures onto that of the MFA to do the calculation, India still spent a slightly higher proportion of its resources on maintaining a diplomatic corps that can be mobilised to conduct oil diplomacy.\textsuperscript{115} In fact, another Indian government department also has a lot to do with the execution of oil diplomacy, as the discussions two paragraphs below illustrate. It is obvious that India devoted more resources to engaging in oil diplomacy than Thailand both in absolute and relative terms in the years leading to 2013 even without factoring in the budget of this department.

India’s oil diplomacy also showed a greater concentration of effort and a tighter focus. In 2009, the Energy Unit within the Indian MEA, formed in 2007, was updated to a “full-fledged division.”\textsuperscript{116} This unit provides concerted effort to enhance India’s energy security by “making sustained diplomatic interventions on energy issues; assisting the government’s efforts to further diversify the country’s supply base for oil, gas…interfacing with nodal Energy Ministries; facilitating R&D tie-ups, and technology transfer…[emphases added]”\textsuperscript{117} Oil diplomacy appeared to be a major focus of this division, as well as the whole diplomatic corps. MEA annual reports of this period routinely documented dozens of oil supply cooperation projects Indian NOCs and government participated in overseas. As the Chairman of ONGC puts it, the company was “thankful to the diplomatic support from the Indian government for catalysing” its expansion and in establishing its overseas E&P subsidiary, OVL.\textsuperscript{118}

In fact, the practice of oil diplomacy, if less formally or professionally, entered the agenda of the Indian Ministry of Petroleum and Gas (MPNG) even earlier. In 2005, two years before the predecessor of MEA’s Energy Division was instituted, the MPNG formed an International Cooperation Division to facilitate “bilateral cooperation with foreign countries both in the upstream and downstream sectors [emphasis added],”\textsuperscript{119} the classic feature of oil diplomacy. This division employed mechanisms such as “meetings at the level of Heads of State/Government/Oil Minister of hydrocarbon-rich countries,” and “holding high-level conferences, such as the India-Africa Hydrocarbons Conference… to seek engagement with oil & gas producing countries/international oil companies” to achieve oil

\textsuperscript{114} One of DMF’s declared strategies reads: “Enhance national energy security through the pursuit and development of energy sources and power systems from both domestic and international sources…” [Thai Department of Mineral Fuels, Ministry of Energy Annual Report 2013, 14
\textsuperscript{115} India’s is 0.7 versus Thailand’s 0.6. Sources of the DMF expenditures for the pertinent years are from the same Budget in Brief reports as listed in footnote 111, but on pages 77, 76, and 67 respectively.
\textsuperscript{116} MEA Annual Report 2011-12, 15.
\textsuperscript{117} Ibid.
\textsuperscript{118} ONGC Annual Report 2013-2014, 4.
\textsuperscript{119} MPNG Annual Report 2007-08, 117.
diplomacy objectives. MPNG officials no doubt provided much needed expertise on oil supply issues to the professional diplomatic corps.

By contrast, no such resources or focused effort were exerted within the Thai MFA or the DMF. There was no special division or unit on oil or energy diplomacy. This may be a reflection of Thailand’s smaller diplomatic clout in absolute terms outside of its immediate neighbourhood. Its oil or energy diplomatic efforts covered mainly the actual and potential hydrocarbon producing areas overlapping with its neighbours and energy cooperation among Southeast Asian economies. Accelerating hydrocarbon E&P in the Malaysia-Thailand Joint Development Area through international cooperation and supporting the development of the Trans-ASEAN gas pipeline, for example, were the only two international projects mentioned in the DMF 2013 annual report. While energy security and cooperation has been mentioned a number of times, oil diplomacy or other oil related issues was not mentioned even once in the MFA’s 2012 annual report. The most pertinent description of related effort reads, “… ambassadors and consulates general were also able to discuss ‘new’ issues such as science diplomacy and energy diplomacy…” A likely contributing reason for this relative indifference is that Thailand had greater confidence than India in acquiring its oil supply through international markets with the prominence of IOCs in its petroleum sectors.

3. Politics of Oil in China

Sustained large-scale production of oil and gas emerged in China in the early 1960s with the development of the Daqing oilfield even if oil and gas had been discovered and used for two millennia. In modern China, all major oil companies have been state-owned and operated, from the 19th century Qing Dynasty bureaucracy, to the Nationalist government’s China Petroleum Corporation headquartered in Shanghai before moving to Taiwan in 1949, and on to the People’s Republic’s line ministries, which were transformed into national oil companies (NOCs) in the late 1980s. The corporatization and public offerings of stocks of subsidiaries of major Chinese NOCs around the turn of this century

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120 MPNG Annual Report 2012-13, 143.
121 Information on Meckling et al.’s studies on Indian NOC internationalization also provides ideas for these two paragraphs, especially on page 17 of “Oil & State Capitalism.”
122 Pages 6 and 16 respectively.
123 MFA 2012 annual report, p93.
has yet to lead to the divestment of their parent companies or turn these subsidiaries into majority privately-owned. Private oil companies have been allowed to participate in the fringes, such as domestic firms operating small oil refineries and gas stations in rural areas, and IOCs partnering with NOCs in technologically challenging E&P projects and marketing oil products.

Oil product pricing in China has gradually become more market-based since the mechanism created under the Oil and Oil Product Price Reform Plan of 1998 replaced direct government control and then the “dual-track system” of previous eras.\textsuperscript{126} While not totally free-floating as of 2013, this pricing system provided room for both domestic and international private oil companies to operate in China’s domestic retail market in the decade preceding 2013. Still, oil supply to the Chinese economy was firmly in the hands of the state with near total control of oil import and indigenous hydrocarbon resources during the period studied, more so than in India.

On the other hand, with still considerable but dwindling hydrocarbon resources, China’s OV was actually relatively low among Asian net oil importing economies as in India. The strength of private capital and trust in oil markets appeared to be also low, again as in India. The implementation capabilities of the two countries, however, was noticeably different. H2 of the vulnerability-interaction model predicts that under such a circumstance, this factor would explain the difference in the level of state intervention according to the logic of the model. The sub-sections below show China’s higher capability appears to explain its adoption of a higher level of strategic oil supply measures than India in 2013.

**Comparison of China and India in 2013:** The second pairwise comparison in this Chapter is between China and India. The goal of the comparative study in this section is to further investigate the cross-case validity of H2 of the vulnerability-interaction model, which strives to explain the causes of variations in the level of strategic oil supply measures adopted by net oil importing economies at any given time. The only substantive difference in the levels of the four explanatory variables between China and India with 2013 data is that China had a trichotomously higher overall implementation capability according to the results in the plausibility probe. If these initial results are confirmed in this study, they would also validate the proposition that a net oil importing economy with a higher overall implementation capability would adopt a higher level of strategic oil supply measures if everything else remains equal.

\textsuperscript{126} For a gist of this mechanism, see Jin Zhang and Mingjia Xie, “China’s oil product pricing mechanism: What role does it play in China’s macroeconomy?” *China Economic Review* 38 (2016): 210-211.
The 2013 data of these two economies presented in the plausibility probe show that their conditions match those stipulated in H2. This means that only one of their four explanatory factors differ in trichotomous levels and their respective DV levels differ in a direction that fits the expectation of the reasoning of the proposed model. This is summarised below:

<table>
<thead>
<tr>
<th>Economy</th>
<th>Strategic Oil Supply Measures Adopted (DV Level)</th>
<th>Oil (IV) Level</th>
<th>Strength of Private Capital</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 4.3 Trichotomous Levels of All Variables for China and India in 2013 in preliminary study

After the levels of each of these variables in the two economies are reassessed with additional and more precise data in this comparative study, the cross-case validity of H2 is confirmed. China adopted a notably higher level of strategic oil supply measures than India in the decade leading to 2013. India’s slightly higher OV does not increase further. The strength of private capital in the Chinese petroleum sectors appears to further weaken, but the cause of that, state orientation, is already factored in the other explanatory factors. China’s slightly lower overall trust level in the oil markets remains. In short, these three explanatory factors remain within the same trichotomously low level. By contrast, China’s overall capability to implement strategic oil supply measures appears to become even higher when the new measures are taken into account. Hence China’s capability was definitely one trichotomous level higher than India’s.

3.1 Strategic Oil Supply Measures Adopted by China and India

China adopted a higher level of strategic oil supply measures than India in 2013 according to the two measures that make up the composite scores of the strategic oil supply indicator in Chapter Three. Both Chinese and Indian NOCs engaged in oil supply projects overseas and still possessed indigenous oil resources in the years leading to 2013. The same two additional measures used in the comparison of India and Thailand, therefore, are appropriate to more precisely ascertain China and India’s DV levels. The first is the overseas oil supply investments Chinese and Indian NOCs engaged in. The second is how much relative preference was given to NOCs in the E&P of indigenous oil sources. The next two sub-sections verify that the Chinese state indeed adopted a considerably higher level of strategic oil supply measures than India during the period studied.

127 The economy’s OV and decision-makers’ trust in oil markets make up the state’s orientation according to the vulnerability-interaction model. See section 3.4 in Chapter Two for more discussion.
3.1.1 Level of Chinese Overseas Oil Supply Investments

Section 2.1.1 above provides the gist of Indian NOCs’ overseas oil and gas projects. How is the scale of those projects compared to the ones Chinese NOCs engaged in during the period leading to 2013? Recent studies on the subject all agree that Chinese NOCs have pursued these projects more energetically and successfully. One yardstick of the sizes of these investments is the value these companies spent on oil and gas company mergers and acquisitions (M&A) globally. Between 2008 and 2013, Chinese NOCs spent US$127 billion cumulatively on these acquisitions compared to the US$10.8 billion spent by Indian NOCs. The size of Chinese NOC oil and gas transactions grew exponentially from a negligible share of all available oil and gas deals globally in 2007 to 4% in 2008 and to 16% in 2013. This timeline fits in with Meckling et al’s analysis that Chinese NOC “internationalization” entered a third phase since 2008 in which the Chinese state acted as a robust “resource supplier” of the process. The two motivations they advanced for Chinese state support of this process in this period are not related to oil supply security, but seem to be unique Chinese circumstances that do not contradict with the reasoning of the vulnerability-interaction model. First is Chinese state financial institutions responding to the Chinese government’s “going out” policy, which encourages all Chinese state-owned enterprises, not just NOCs, to expand overseas. Second is finding productive outlets for China’s “mammoth USD” foreign exchange reserves. Andrews-Speeds and Dannreuther describe Chinese NOCs’ overseas activities as a “resurgence” since 2009.

Another way to compare the scale of overseas oil and gas projects which is more pertinent to oil supply security in the more immediate term is the oil actually developed from those projects. The amount generated by the major Indian NOC that carried out such projects, the OVL, as noted in Section 2.1.1, was 8.357 MMT during the year 2013-14 in at least eight countries. All three major Chinese NOCs, China National Petroleum Corporation (CNPC), China National Petrochemical Corporation (Sinopec), and China National Offshore Oil Corporation (CNOOC), and their publicly-listed subsidiaries, as well as some minor but also state-owned firms, such as the China National Chemicals Import and Export Corporation (Sinochem), engaged in these projects. CNPC has been the largest Chinese

128 See for example, Meckling et al, 1167; Carl, Rai, and Victor, 19; and Lydia Powell, “Geopolitics of India’s equity investments in energy,” Energy Security Insights 7-3 (July – December 2012): 3.
129 Meckling et al, 1167.
131 Meckling et al, 1170-1171.
132 China, Oil and Global Politics, 73 – 75.
133 For lists of different oil related overseas investments these companies engaged in between 1992 to 2007, see Kong, China’s International Petroleum Policy, 170-189.
NOC and is used here to compare with its counterpart, OVL. It developed 59.20 MMT equivalent of “equity” oil and gas [权益当量油气] from projects in 34 countries in 2013. If we go back five years to 2008, CNPC produced 35.5 MMT equivalent of equity oil and gas that year. While it is not clear how many countries CNPC developed oil in at the time, it signed 15 new oil and gas development contracts that year with countries including Venezuela, Niger, Qatar, Costa Rica, and Iraq. OVL produced oil and gas in 16 countries, and yielded 8.78 MMT equivalent of equity oil and gas in 2008-09.

In sum, China’s six-year accumulative overseas oil and gas M&A ending in 2013 was more than eleven times that of India’s. The oil and gas produced from overseas projects by the biggest Chinese NOC was more than four times in 2008, and more than seven times in 2013 than that produced by the India’s major upstream NOC. This number would be at least doubled if we also count the amount developed by other Chinese NOCs. Judging by this additional measure alone, China’s strategic oil supply measure level was notably higher than that of India in the years leading to 2013, even if we factor in the almost three times higher oil consumption of China in 2013.

### 3.1.2 Preference to NOCs for Development of Indigenous Oil in China

China had a higher oil self-sufficiency rate than India in 2013, and both countries’ NOCs engaged in the E&P of indigenous oil resources. Examining the relative preference given to their respective NOCs in this domain is, therefore, an appropriate measure of the level of strategic oil supply measure they adopted. The Indian indigenous oil E&P regime in the years leading to 2013 was present in section 2.1.2 above. In short, the NELP that governed domestic oil and gas E&P in India did not give preference to state-owned or even domestic private oil firms on a legal basis.

Chinese oil exploration laws were heavily tilted in favour of NOCs and other SOEs and more restrictive to private capital participation than India’s. According to an

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134 CNPC is more akin to ONGC, but OVL is the ONGC’s subsidiary that engages in overseas projects. Of course, CNPC and ONGC are not really comparable in the sense that the former is a vertically integrated firm but the latter is an upstream oil firm. Since most overseas oil and gas investments have been upstream projects, the comparison of these firms are still appropriate.


137 Ibid.


139 CNPC’s overseas investments were estimated to be about 49% of those made by all three major Chinese NOCs as of 2011. See Zhao Qingsi, International Cooperation and Chinese Energy Diplomacy – Concepts, Mechanisms and Pathways (China: Law Press, 2012), 219. [赵庆寺 国际合作与中国能源外交—理念，机制与路径华东政法大学出版社]

140 Using the data in the BP Statistical Review of World Energy June 2014 to do the calculation, China’s was 41.02% and India’s was 23.94%.
international law firm report on Chinese energy and natural resources laws, the “Chinese
government owns all oil and gas resources in China. Exploration and exploitation of oil and
gas resources are currently only granted to state-owned enterprises (SOEs) through set
procedures.” These included the three central-level NOCs, collectively known as the
“three barrels,” and Yanchang Petroleum Group, an SOE of the Shaanxi Provincial
Government.

This was especially true for the E&P of conventional oil and gas, which offered
only “very limited participation for private firms, either domestic or and foreign.” Only
the “three barrels,” were authorised to cooperate with foreign companies by entering into
production sharing contracts (PSC) with them. “Under the PSC structure, the Chinese
partners hold the exploration and exploitation rights while the foreign partners serve as the
operator managing the exploration, development and production of the venture.”

Technically, E&P “rights could also be obtained through public bids,” but in practice, this
rarely happened. Private firms appeared to have slightly more leeway to participate in the
E&P of unconventional oil and gas, such as coalbed methane, oil shale, oil sand and shale
gas. There are, however, still many uncertainties and ambiguities in the implementation of
these recent deregulation developments, an issue which is beyond the scope of this study.

The Chinese state, therefore, had a much tighter control over who and how Chinese
hydrocarbon resources were developed as of 2013 and hence adopted a higher level of this
particular strategic oil supply measure than India.

3.2 Oil Vulnerabilities of China

The same additional market risk, oil intensity of the economy, and additional
supply risk, the concentration of the sources of oil supply, are used to verify India and
China’s OV levels in this comparative study. Again, the Indian economy’s oil intensity in
2013 was 0.027, while China’s was 0.031, calculated with the same method and sources of
data as in the first pairwise comparison. This indicates that China’s economy was more oil
intense than India’s. China, therefore, was almost 15% more vulnerable to increase in oil
prices than India in 2013 by this additional measure alone.

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141 Jin Xiong, Yan Zhao, and George Zhao, “Oil and gas regulation in China: overview,” Energy
id&blobtable=MungoBlobs&blobwhere=1248118002173&ssbinary=true.
143 Xiong et al.
144 Ibid.
145 Ibid.
146 Ibid.
The same modified HHI Index, weighted with the comprehensive risk of individual supplying countries, is used to measure the concentration of the sources of oil supply to China and India. China’s score in 2013 was 66.89 compared to India’s 87.24. China, therefore, had a 23.32 percent lower physical supply risk of oil than India by this measure alone.\textsuperscript{147}

India’s 2013 OV score calculated with the four measures in the preliminary study was slightly higher than that of China. The two economies’ OV widens slightly after adding the two measures here, but would be still at the same trichotomous level.\textsuperscript{148}

3.3 Strength of Private Capital in China

The historical-institutional source of the strength of private capital in the overall Chinese economy in 2013 is gauged with the same two off-the-shelf indicators. China’s combined average 2013 overall economic freedom and openness score was 58.45 versus India’s 60.9. Private capital in India, therefore, would have greater historical and institutional support against state intervention in their actions according to the criteria adopted for the vulnerability-interaction model.

This comparative study employs the same four-scenario domestic-international-capital-state balance framework. The conclusion is that domestic private capital in China’s petroleum sectors was definitely weaker than international capital in absolute terms, but both were much weaker than NOCs within China, even more so than in India. China, like India, fits in scenario three of the domestic-international-capital-state balance analytical framework. State capital in the Chinese petroleum sectors, however, played a much stronger role than international capital did in China’s overall economy. The reverse was true in India.\textsuperscript{149} This seems to suggest the Chinese state has placed great strategic importance on these sectors or it has a strong aversion of letting foreign companies operate in these sectors. More analysis of the state’s orientation, the determinant factor in scenario three of this analytical framework, in the form of trust in the oil markets, is the subject of the next section.

Adding the actor-specific source of private capital strength appears to slightly widen the gap of the overall strength of private capital between China and India. This is especially

\textsuperscript{147} For details of the calculation of these scores, see Table A13, Appendix C. It should be noted that this index does not take transit route risks into account, which has been a major concern of China. See Section 3.4.3 below for more discussions. The higher transit route risks for China would narrow the gap of the physical supply risk it had with India, and hence the overall OV between China and them.

\textsuperscript{148} If all these components have the same weight.

\textsuperscript{149} The five-year (2009-2013) overall net inbound FDI to China accounted for 3.22\% of its GPD versus India’s 1.80\%. This is calculated with the same World Bank data as in the case of India. While no concrete figure is found on FDI in China’s petroleum sectors as a percentage of total inbound FDI, it appeared to be smaller than 3\% (see discussions in the following sub-section). That figure for India was about 3\% of petroleum sectors. See section 2.3.1 above.

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true in their respective petroleum sectors, but the difference does not appear to amount to a placing them in differing trichotomous levels.

### 3.3.1 Strength of Private Capital in Chinese Oil Sectors

As discussed earlier, in the decade leading to 2013, the Chinese upstream oil sector was almost completely dominated by the “three barrels.” China did allow IOCs to participate in offshore oil and gas development since the early 1980s, which Chinese NOCs lacked the technology or expertise to pursue on their own.¹⁵⁰ These invitations were later extended to some onshore projects. Since then, for example, “U.S. oil companies have launched dozens of joint ventures with Chinese partners to conduct geological surveys and engage in the refining sector in China.”¹⁵¹ This push for introducing and eventually reproducing advanced foreign energy technologies and equipment in China continued and was codified in energy planning directives for the 12th Five-Year-Plan starting in 2011.¹⁵² Yet, even the provincial-level SOE Yanchang Petroleum and a few IOCs only played a very small part in the upstream sector, and the opportunity for domestic private oil firms to participate “was basically non-existent.”¹⁵³

Chinese domestic private oil firms mainly concentrated in the mid- and downstream oil sectors. Even there, they were very weak in the years leading to 2013. The bottleneck for them was where and how to source crude oil to feed their refineries or oil products to fill up their service stations. In 2010, domestic private oil refiners produced 11% of oil products sold in China, a 2% increase over the previous year. The oil products private refiners produced, however, must be sold to either CNPC or Sinopec for wholesale distribution, according to the State Council “Document 38” promulgated in 1999.¹⁵⁴ The state issued a directive calling for the dismantling of installations with production capacity

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¹⁵⁰ Andrews-Speed and Dannreuther, *China, Oil and Global Politics*, 64.
¹⁵⁴ Ibid, 57. CNOOC traditionally concentrated on offshore oil E&P only, but it began to participate in oil refining, product distribution, and setting up its own service stations in the few years leading to 2013. Another company that also began to engage in these activities in the same period was Sinochem, a central-level SOE which traditionally only engaged in oil trading. Ibid. Also see “Energy Business,” Sinochem website. Accessed 1 December 2016, [http://www.sinochem.com/en/1437.html](http://www.sinochem.com/en/1437.html).
under two million tons per year by 2013. As of the end of 2010, over 80% of local refineries were under this capacity. At the end, only seven such refiners met the criterion and continued to operate.\textsuperscript{155} Domestic private firms also tried to engage in oil product distribution. Of the over 2,500 sizable oil product wholesaling firms in China in 2012, however, CNPC and Sinopec owned over 1,600 of them, and other SOEs owned three hundred. Only six hundred were domestic private firms.\textsuperscript{156}

Private capital, both domestic and international, was the most active in the Chinese downstream oil sector. As of 2010, there were a total of 95,740 service stations in China, a little less than 19% belonged to CNPC and a little over 31% to Sinopec. Other SOEs and foreign companies owned more than 2,000, which was about three percent. The remaining 47% or about 45,000 of service stations were owned by domestic private firms.\textsuperscript{157} BP, ExxonMobil, and Shell were the three major IOCs that entered the Chinese oil products retail market and set up service stations recently in China.\textsuperscript{158} These numbers, however, belie the fact that NOCs, especially CNOOC and Sinopec, still covered 85% of the volume of oil product sales in all service stations, while domestic private oil firms covered only about 10% during the period under reviewed.\textsuperscript{159}

It was very difficult for domestic private oil companies to compete with NOCs and other SOEs engaging in oil supply not only because of laws and regulations that favoured the latter. Domestic private oil firms were also much smaller in size and lacked capital and other technical attributes. Enterprises, for example, were only qualified to apply for the license to sell crude oil in China with a minimum registered capital of RMB100 million or almost US$16 million. No domestic private oil company was qualified as of 2012.\textsuperscript{160} Domestic private oil companies formed a couple of trade groups over the years to try to lobby for their interests, such as the repeal of State Council directive that greatly reduced the operating space of small, private oil sector enterprises (“Document 38”). The more representative of these was the China Chamber of Commerce for Petroleum Industry established in 2004.\textsuperscript{161} According to an analyst at the CNOOC Energy Economics Research Institute, however, these groups were ineffective and unstable because the interests of their

\textsuperscript{155} Ibid., 60.
\textsuperscript{156} Ibid, 58.
\textsuperscript{157} Li, “Development Situation and Prospect of Chinese Private Oil Enterprises,” 58.
\textsuperscript{158} Ibid., 59.
\textsuperscript{159} Ibid.
\textsuperscript{160} Ibid., 58. The US dollar equivalent amount is calculated with the 1 January 2013 historical exchange rate. See Oanda website, accessed 13 December 2016, https://www.oanda.com/currency/converter/.
members did not line up.\textsuperscript{162} Another reason appears to be the tremendous legal, as well as political obstacles they must overcome to further their interests.\textsuperscript{163}

The analysis in the previous paragraphs indicates that domestic private capital was weaker than both international capital and NOCs in the Chinese oil sectors in absolute terms as of 2013. It is not easy to gauge the relative strength of domestic capital and international capital within China. Neither had much room to operate under the legal and de facto monopoly of the “three barrels” as well as competition from other SOEs. As of 2013, private capital as a whole was nowhere near parity in strength with national-level NOCs within China. Yet, they carved out niches according to their different characteristics. With much larger capital bases and technical expertise, IOCs have been comparatively more active in the upstream sector than domestic private firms. Domestic companies survived in the mid- and downstream sectors with their historical and local connections.\textsuperscript{164}

It is also not easy to compare the strengths of Chinese NOCs with those of IOCs in absolute terms. The “three barrels” are not publicly-listed and therefore do not need to provide transparent and accurate accounting information. Their publicly-listed subsidiaries are quite large by global standards, even if they still lagged behind the biggest IOCs.\textsuperscript{165} In any event, due to various forms of entry barriers and historical factors as discussed earlier, within China, Chinese NOCs were without a doubt much stronger than IOCs. The actor-specific source of the domestic-international-capital-state balance in China in the years leading to 2013, therefore, fits in the third scenario or the bottom right quadrant of the framework, the same as India.

3.4 China and India’s Overall Trust in Oil Markets

This section examines each component that is hypothesised to make up China’s overall trust level in oil markets’ ability to ensure oil supply security in greater detail. The goal is to verify if China and India deserve to receive the same trichotomous overall trust level as in the preliminary study. Similar content analyses of NOC annual reports and more detailed data related to Chinese NOCs as securitising agents as well as to the pertinence of

\textsuperscript{162} Zhizhuan Li, “Development Situation and Prospect of Chinese Private Oil Enterprises,” 60.
\textsuperscript{163} It is telling that the first “goal” listed in the “Introduction” of the organization’s website is to “adhere to the Party line, principles, and policies.” The second was “Educate members to love the nation, respect their industry, and be law-abiding.” “Actively protecting the legal rights of members” is only listed third.
\textsuperscript{164} Many of them were established in the early days of the petroleum sector reform when rules were more lax and contributed greatly to the local economy through payment of taxation and creation of employment opportunities.
\textsuperscript{165} By the measure of stock market capitalization alone, PetroChina, (subsidiary of CNPC), was ranked the 2\textsuperscript{nd} in 2012 and the 4\textsuperscript{th} in 2013 on the IHS Energy 50, which the world top 50 energy firms. Sinopec Corp., subsidiary of Sinopec Group was ranked the 11\textsuperscript{th} in 2012 and 10\textsuperscript{th} in 2013; and CNOOC Ltd., subsidiary of CNOOC Group, was ranked 10\textsuperscript{th} in 2012 and 13\textsuperscript{th} in 2013. “IHS Energy 50 – The Definitive Annual Ranking of the World’s Largest Listed Energy Firms, January 2014.”
the domestic and external securitization contexts serve as the basis of understanding the country’s overall trust level around 2013.

The conclusion is that while China and India both had a low overall level of trust in the oil markets, Chinese NOCs appeared to less enthusiastic securitising agents than their Indian counterparts. The external context that is hypothesised to be critical to impacting the overall trust level, however, was more salient to China and hence more than made up for Chinese NOCs “slack” relative to securitisng. Indeed, the salience of the external context appeared to engender another group of more enthusiastic securitising agents.

3.4.1 Securitising Agents

Both China and India receive the lowest trichotomous score for the securitisng agent component in the preliminary analysis in Chapter Three, which is hypothesised to lead to the lowest level of trust in oil markets. This is based on the fact that the two economies each have at least one traditional NOC. In this sub-section, the coherence of Chinese NOCs as securitisng or lobbying agents and evidence of their securitising attempts are examined to compare with those by Indian NOCs. The same procedures and terms or their Chinese equivalents as detailed in Section 2.4.1 above are used to conduct analysis.

Like India, China had a number of NOCs, but they had mostly been vertically integrated in the years leading to 2013. A content analysis of the annual reports of the “three barrels” and their subsidiaries from 2009 to 2013 is presented here to look for evidence that they routinely play up their importance in ensuring the oil supply to and distribution within the economy.

Chinese NOCs and their subsidiaries only engaged in slight to moderate securitisng by analysing the contents of their annual reports alone. The five-year average of the overall securitisng score of the subsidiaries was 4.07, only about 11% that of Indian NOCs’ overall score of the same period. The subsidiaries of “the three barrels” were large multinational corporations listed in international stock exchanges, even if they were still majority-owned and tightly controlled by their parent NOCs. It is, therefore, unsurprising that they would tone down any securitisng effort in their annual reports. The two-year average overall score

166 India’s ONGC and IOCL together receive a five-year average overall score of 37.2. The 2009 – 2013 English language annual reports of PetroChina, Sinopec Corp., and CNOOC Ltd. were analysed to get this overall score. A comparison of the Chinese and English language of the pertinent annual reports shows that they are fairly accurate translated versions of each other and so only the English language ones were analysed.

167 As of 2013, CNPC owned 86.5% of PetroChina; Sinopec Group owned 73.96% of Sinopec Corp.; and CNOOC Group owned 64.566% of CNOOC Ltd. See pages 15, 16, and 57 of these three companies’ 2013 annual reports respectively. Shares of PetroChina were initially offered to the public in May 2000; those of Sinopec Corp. in October 2000; and those of the CNOOC Ltd. in February 2001, all in the New York and Hong Kong stock exchanges. See Kong, China’s International Petroleum Policy, 168. Publicly listed Indian NOCs are only listed in the domestic stock exchange in Mumbai.
of the actual “three barrels,” was considerably higher at 14. After all, the Chinese public and central-level decision-makers, the target audience of any securitisising effort, are unlikely to read the English language annual reports of these companies. Still, even this score was only 37.41% that of India’s. On the surface, this shows that Chinese NOCs were much less forceful or coherent securitisising agents.

This interpretation of these results should be checked against the background of the near upstream and midstream monopoly enjoyed by Chinese NOCs in the decade prior to 2013. The need for Chinese NOCs to lobby for their continued existence was smaller as there was not much real competition. As detailed in the last section, there were more stringent legal barriers for private firms to enter China’s various petroleum sectors. Besides, in the decade leading to 2013, the state had internalised the idea originated by CNPC that NOC overseas expansion was needed to ensure China’s oil supply security. The Chinese state has since acted as a robust resource supplier and a weak veto player for Chinese NOC internationalisation as Meckling et al and others have pointed out. Under such circumstances, Chinese NOCs also did not have much need for powerful lobbying of their expansion. Unless there are radical structural or institutional changes that meaningfully reduce the overwhelming dominance of NOCs in China, therefore, these companies would not need to put too much energy in securitisising or lobbying, at least not through the public means of what they say in their annual reports.

In any event, Chinese NOCs did engage in some securitisising with the contents of their annual reports. In line with the reasoning that the more secure a company is relative to its dominance, the less the need to securitise or lobby for its activities, the two-year average scores of the “three barrels” matched their dominance in the upstream oil sector in China. CNPC, which produced over 31% of the oil consumed in China in 2013, scored only 4. CNOOC Group, which produced about 13% of oil consumed, scored 15.5. The weakest

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168 These are the 2012 and 2011 annual reports of CNPC and the 2013 and 2012 annual reports of Sinopec Group and CNOOC Group. The current website of CNPC only provides annual reports of itself for years 2014, 2015, and 2001. All the other annual reports provided are those of PetroChina (in Chinese). Accessed 12 December 2016, http://www.cnpc.com.cn/cnpc/ndbg/gywm_list.shtml. The 2012 and 2011 annual reports of CNPC were obtained from the company’s website in 2014.

169 According to Kong, the idea was initiated by CNPC in 1991, but was only fully embraced by top level political leaders in the late 1990s when oil import to China increased exponentially. See China’s International Petroleum Policy, 37-46.

170 Andrews-Speed and Dannreuther go one step further to say that from the earliest days, the state actually played “a key role” in these NOCs’ internationalization. See China, Oil and Global Politics, 83-85.

171 This is in comparison to the zero three-year overall score of ExxonMobil got during the same period.

172 The 31.5% is calculated with the consumption data in the BP Review 2014 and the production figures in the CNPC 2013 Annual Report (in English), p6.

173 The 13.17% is calculated also with the BP 2014 Review and the CNOOC Group 2013 Annual Report (in English), p6.
of the three, Sinopec, scored 22.5. \footnote{Sinopec Group produced less than 9% of the crude oil consumed in China in 2013. Its production figure is obtained from page 6 of its 2013 English annual report. The rest of the crude China consumed were produced by the subsidiaries of the three barrels, as well as imported and produced by other SOEs.} CNPC scored very low for the terms that are used to detect the general securitising agent role of NOCs compared to the other two companies. For the two years of its annual reports analysed, the term “energy security” was only mentioned once. \footnote{It was used in the sentence “[the company] has made new contribution to ensuring the nation’s energy security and to promoting the continued healthy development of the national economy.” CNPC 2012 Annual Report (in Chinese), 3.}

By contrast, CNOOC and Sinopec used the general securitising agent terms of “strategic” and “security” in a pertinent way more frequently. \footnote{As a reminder, when these terms are used in contexts irrelevant to securitising or lobbying, such as “social security” or “strategic committee,” they receive the score of zero in the analysis.} Some interesting examples specially related to the offshore hydrocarbon E&P niche of CNOOC read: “The 18th National Congress of the Communist Party of China has made the strategic deployment of building [China] into a maritime power. This has provided a new opportunity for elevating the development of a maritime economy as a national strategy, and for the major development of the offshore oil industry”; \footnote{CNOOC 2012 Annual Report (in Chinese), 5.} and “We must actively undertake this mission…to raise our ocean resource development capability to ensure the nation’s energy security…and to make requisite contribution to building a ‘beautiful China’ and a ‘maritime power’.” \footnote{Ibid., 4.}

3.4.2 Chinese Domestic Context

China, like Thailand, was more “wealthy” and urbanised than India as of 2013. By these two measures, therefore, the objective domestic context should allow decision-makers in China to have fewer worries about trusting an unfettered domestic market or relying solely on private oil firms to ensure oil supply security. China, however, had a noticeably less even income distribution among its citizens than India. \footnote{The only GINI index data for India from the World Bank was for 2011 and the reading was 35.2. See footnote 81 above. In the period studied, data are only available for China in 2008 and 2012. The two very similar readings are average to obtain the reading of 42.5, which was also considerably higher than Thailand’s five-year average reading of 38.74. See “GINI index (World Bank estimate) – China,” the World Bank website. Accessed 15 December 2016, http://data.worldbank.org/indicator/SI.POV.GINI?end=2012&locations=CN&start=2008.} As in the case between Thailand and India, adding the factor of the evenness of income distribution actually narrows the gap in decision-makers’ trust in the domestic market in the two economies than the results in the preliminary study suggest.

In addition, a survey on how differing cultures affect the public perceptions of energy security shows that respondents from developing countries including China and India...
“did rate affordability and equitable access to energy services to be of higher importance than respondents” from advanced economies. 180 In fact, the results show that Chinese respondents, over half of whom had postgraduate education, rated these aspects of energy security slightly higher than Indian respondents. 181 These results support the propositions of the vulnerability-interaction model that different cultures would have an impact on the risk preference and belief formation of decision-makers and affordable and equitable access is a relevant domestic context for securitising.

A content analysis of terms pertinent to securitising the domestic oil supply context in the annual reports of Chinese NOCs shows that their efforts lagged even further behind those of Indian NOCs. 182 English language annual reports of NOC subsidiaries hardly mentioned serving the oil supply needs of poor or remote rural communities at all. Poverty alleviation projects in remote counties were only mentioned twice in CNOOC Ltd.’s annual reports. The Chinese language annual reports of the parent companies on the whole fare little better. Again, the same inverse relationship between securitising effort and NOC dominance in the upstream oil sector is observed. In this case, CNPC annual reports did not contain words pertinent to serving the community or even poverty alleviation effort at all in the two years analysed in this project.

One possible reason for Chinese NOCs’ lackadaisical attitude is that many oil product retail outlets in low sales volume rural and poor areas might be operated by domestic private firms with local connection, not by the “three barrels.” As mentioned in Section 3.3.1 above, almost half of all oil product retail outlets in China were operated by domestic private firms, but these outlets only covered about 10% of the sales volume of the retail market. Besides, in the decade leading to 2013, the oil product pricing mechanism in China, although not totally liberalised, was linked to international oil prices in a delayed manner. 183 On the
surface, this pricing mechanism should not deter private firms from serving the poor population as much as the artificially low oil product pricing, especially in diesel and kerosene, in India would. Chinese NOCs securitising their function of serving the underprivileged, therefore, would sound disingenuous.

An interesting observation is that Chinese NOCs took a much more realistic attitude toward the idea of self-sufficiency or self-reliance than Indian or Thai NOCs. These terms did not show up in any of the 21 Chinese NOC annual reports analysed, regardless of their language or company. China crossed the line to become a net oil importing country in 1993. Chinese NOCs have been pragmatic about this situation and have assigned emphasis on overseas expansion to acquire the resources instead. This in turn may be due to the fact that they had greater material capability to do so.

In sum, the domestic economic and cultural contexts that would provide the opportunity for NOCs to securitise the role they played in the oil supply within their respective economies did not differ too much in China and India in the period studied. This is especially true when the additional evidence presented in this sub-section is taken into consideration. The survey cited earlier seems to confirm the similar level of importance the public in the two countries placed on equitable access of affordable energy. This likely engenders similar risk preferences among the two countries’ policymakers in entrusting the oil supply within their respective economies to totally free markets without any form of state intervention.

Two of the three major Chinese NOCs did highlight their roles in poverty alleviation, but not oil supply activities in remote rural areas in the two years of their annual reports analysed in this project. In representing their efforts, however, they were much less enthusiastic than Indian NOCs. Yet analysing Chinese NOC annual reports may not be a reliable way to understand the true extent of their securitising efforts.

The stringent entry barriers to the Chinese petroleum sectors and their only partially deregulated oil product pricing regime (despite three decades of sectorial reforms) seem to be indicative of the government’s limited trust in an unfettered domestic oil market. According to Chen Shaofeng, Associate Professor at the Peking University who specialises in reviewing these sectors, the Chinese state tried to introduce competition among NOCs and elements of the market mechanism to improve the efficiency of the Chinese petroleum sectors, and hence the economy’s oil supply security. At the same time, it tried to retain

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184 Terms like “resource strategy” appear in NOC annual reports to mean employing all kinds of methods to deepen the resource bases of the companies, both domestically and more often, used in the same breath as internationalization or overseas development.
control of the “marketisation process” because of “concerns about the possible destructive effects on national security, socio-political stability and economic development resulting from disruptions of the oil and gas supply and price fluctuations.”

3.4.3 External Securitising Context of China

China is the only case-study economy in the plausibility probe that receives the lowest trichotomous score for its relationship with the United States. This denotes a relatively negative, or what the vulnerability-interaction model labels a “neutral-conflictual” relationship between the two countries in the years leading to 2013. Objectively, such a state of affairs should not have any bearing on the effectiveness of the oil supply function of international oil markets. As reiterated in the paired comparison between India and Thailand, interested parties in net oil importing countries with such a relationship with the United States can easily exploit the situation to securitise the untrustworthiness of the international oil markets. A major way to do so is by propagating the aggressive zero-sum strand of economic nationalism, which would be less convincing in countries having a positive relationship with the United States, which has generally been a promoter of free trade since the end of World War II.

This sub-section examines Chinese-U.S. relationship more closely to verify if it deserves that lowest trichotomous score and if their relationship did result in China having a lower level of trust in the international oil markets than India. In this project, only countries that are formal or de facto defence allies of the United States receive the highest external context score. This is not applicable to either China or India. This paired comparison, therefore, only needs to examine whether China’s relationship with the United States is of a similar or a lower quality than the Indian-U.S. relationship in the decade leading to 2013.

There have been a plethora of academic studies and punditries on China-U.S. relationship, ranging from very pessimistic or conflict-deterministic to more nuanced and

186 The first-order effect of this reasoning would facilitate securitization of the untrustworthiness of the international oil markets in China since the United States has long been the hegemonic power and dominant (international oil) market player. Once this securitization began and caused China to adopt more strategic oil supply measures, however, the situation may be exploited by interested parties in the United States to securitise any oil supply activities adopted by Chinese NOCs, seen as agents of the Chinese state. Increased levels of securitization of oil supply on both sides, therefore, can easily spiral into a vicious cycle of mutual distrust and a higher level of strategic oil supply measures adopted by both countries, not unlike the dynamics described by the security dilemma theory. Whether this downward spiral actually materialises would hinge on the confluence of confirming (and enabling) and disconfirming (and disabling) factors at the time.
balanced to anywhere in between. David Shambaugh, one of the foremost American Sinologists, coined the term “coopetition” to describe the “competitive coexistence” between China and the United States in the period studied. Despite the deeply interdependent nature of this relationship and some areas of cooperation between the two countries, Shambaugh summarises the prognoses of many observers this way:

…the U.S.-China relationship has increasingly tended towards competition in recent years. This is plainly evident in the economic, ideological, normative, security, and geopolitical realms. Divergence rather than convergence of interests [emphasis original], approaches, and policies increasingly characterize the relationship…institutionalized efforts [to pursue cooperation and coordination] are increasingly ephemeral and episodic, while the deeper competitive forces threaten to overwhelm the efforts for cooperation…The sphere of cooperation seems to be shrinking while the zone of competition is expanding.

Even observers with more sanguine views of the state of the China-U.S. relationship have no difficulties coming up with conflictual Sino-American national interests. Furthermore, upon closer inspection, some of the more “optimistic” views of China-U.S. relationship can hardly be classified as even “neutral” by most standards. Charles Glaser, for example, asserts that “China’s rise need not be nearly as competitive and dangerous as the standard realist argument suggests.” Yet, the sources of his “optimism” are mutually assured destruction provided by nuclear weapons, to be extended to Japan and

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188 An example of this category of studies is Rosemary Foot, “Chinese strategies in a US-hegemonic global order: accommodating and hedging,” International Affairs 82-1 (2006): 77-94; and
190 Examples of their interdependence include: “They were each other’s second largest trading partners, the U.S. is the largest source of foreign direct investment in China, while China is the largest foreign creditor of the United States.” Ibid. Examples of cooperation include climate talks, anti-terrorism during Beijing Olympics, and nuclear non-proliferation towards North Korea. See Shirley A. Kan “U.S.-China Counterterrorism Cooperation: Issues for U.S. Policy,” Congressional Research Service, July 15, 2010, 21-22; and nuclear non-proliferation effort over the Korean Peninsula, backing UN plan for stability in Sudan in 2006 and initiating naval anti-pirate operations off the Coast of Somalia in 2008. See Thomas J. Christensen, “The Advantages of an Assertive China: Responding to Beijing’s Abrasive Diplomacy,” Foreign Affairs, 90-2 (March/April 2011):56.
191 Tangled Titans.
192 For example, while questioning numerous premises of Yan Xuetong’s “superficial friendship theory” which explains the “unstable China-U.S. relationship,” Alastair Iain Johnston points out China’s naval development to “prevent/deter the USA from monopolizing Sea Lines of Communication” and “China’s efforts to promote certain Confucian values versus US liberalism” as may be put on the list of the two countries conflictual interests. At the same time, Johnston, like many other observers, points out many “common and complementary interests” or cooperative efforts between the two. See “Stability and Instability in Sino-US Relations: A Response to Yan Xuetong’s Superficial Friendship Theory” The Chinese Journal of International Politics, Vol. 4 (2011): 5-29.
South Korea, a reduced U.S. commitment to the “less-than-vital interest” of Taiwan, and the “separation by the Pacific Ocean.”

The above analysis shows that China-U.S. relations were at a lower quality than that between India and the United States of the same period. If India’s “strategic autonomy” prevents it from being a close friend of the United States, “strategic distrust” seems to be at the heart of the fraught relationship between China and the United States. A report on the subject by an American think-tank identified the three fundamental sources of this distrust as “different political traditions, value systems and cultures; insufficient comprehension and appreciation of each others’ policymaking processes… and a perception of a narrowing gap in power between the United States and China.”

There are parallels between how this distrust developed suggested in that report and how a negative relationship with the United States can be securitised to undermine China’s trust in the fairness or reliability of the existing international oil markets. First, the report says “various sources indicate that the Chinese side thinks in terms of a long-term zero-sum game.” If this is true, that means Chinese decision-makers are already “primed” to be securitised about the untrustworthiness of major international oil exchanges by the way suggested by the vulnerability-interaction model. The biggest oil exchanges in the world have been owned and operated by American firms. These exchanges may be seen as part of economic nationalistic scheme to perpetuate U.S. economic and political pre-eminence in the world.

If it is not true that China elites by and large think in zero-sum terms, it seems to suggest American elites project mercantilist intentions onto “the other” partly due to different value and cultural systems. In fact, the report goes on to say that “economically, the United States worries that China’s mercantilist policies will harm the chances of American economic recovery.” One way or the other, the situation seems to fit in the oil supply securitisation spiral suggested earlier. It is exactly this kind of zero-sum logic that is behind what is listed as one of China’s “challenges” to ensure hydrocarbon supply security in an article attributed to the CNPC Economics and Technology Research Institute.

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194 Ibid., 91.
195 See footnote 95. Madan, “The U.S.-India Relationship and China.”
197 Ibid., xi.
198 Ibid. ix.
199 See footnote 74 in Chapter Three.
200 Ibid., ix.
The increasing energy independence of the United States helps to increase the space and flexibility of its global policy manoeuvring...so that the geopolitical role of the energy “weapon” can be given greater play. This [independence] can also provide it with a greater array of strategic tools. By influencing the energy situations in the Middle East and Africa, it can restrain the dominant position of the OPEC in the world petroleum markets, as well as greatly intimidate large hydrocarbon importing countries like China, thus strengthening its control of the energy security of the world.

Second, the same report on strategic distrust says “China also views the U.S. as taking advantage of the dollar as a reserve currency and adopting various protectionist measures to disadvantage the PRC economically.”\footnote{Ibid., viii.} Again, this sentiment seemed to make decision-makers receptive of the securitisation about the “unfair advantage” to the United States of the dollar-denominated trading in the existing international oil markets. Regardless if it was the result of securitisation by interested parties in China, its unhappiness of this “advantage” was among the reasons prompted its quest to establish China’s own international energy exchange with trading denominated in yuan.\footnote{Andrew Critchlow, “China’s new oil contract signals shift from Brent and US dollar,” The Telegraph, 7 September 2015. Accessed 20 October 2015, \url{http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/11848172/Chinas-new-oil-contract-signals-shift-from-Brent-and-US-dollar.html}.}

In fact, one of the measures to enhance oil supply security suggested in the same article attributed to the CNPC Economics and Technology Research Institute calls for the establishment of a crude oil futures market and a nationwide oil spot market in China as soon as possible “to set benchmark prices for the region and even the whole world to increase China’s control over pricing.”\footnote{“An analysis and reflection on China’s oil security,” 66.} Intriguingly, however, an article from the same edited volume authored by Chen Weidong, Chief Energy Researcher of the CNOOC Energy Economics Institute, projects a very pro-market posture. He enthusiastically advocates Chinese NOCs, private firms, and sovereign fund to participate in oil futures trading as it “dominates modern international oil trading.”\footnote{Page 134} He also says, “a great power’s responsibility is not to ‘get the drums rolling to set up a new shop’ but to actively participate, make accomplishments, create harmony, and make developments together.”\footnote{“China’s oil industry—only reforms and innovation promise a future,” in China’s Energy Security: Current Situations and Strategic Choices, ed. Fan Gang Fan and Ma Weihua, 134. [陈卫东，中国石油工业－唯改革唯创新才有未来]}

This divergence of views may be explained by what individual NOCs decided (as of 2012) to be the most effective way to engage in securitisation or desecuritisation to further...
their interests. As explained in Chapter Two, many NOCs in net oil importing countries, especially the ones with some form of oil price control in their home countries, have been participants in, and at some point also beneficiaries of trading in the existing international oil markets. Chinese NOCs and their publicly-listed subsidiaries were no exceptions. In fact, they reportedly have been relatively adroit and aggressive traders in recent years.207 The analysis earlier in this chapter intimates that the de facto monopoly the “three barrels” enjoyed in the Chinese upstream sector was the key to their dominance. In view of the Chinese government’s recent move to relax unconventional hydrocarbon E&P in China by private firms, desecuritising the importance of that sector would be a worthy attempt by NOCs. Sure enough, Chen claims that “focusing on upstream makes little sense…Although increased investment could still boost production, it is not a reasonable option in today’s market economy…opening the upstream will not bring fundamental changes to the Chinese oil industry.”208

That China was dependent on oil that had to be shipped through sea lanes only the United States had naval capability to block and the relatively negative relationship between the two countries have made this topic much securitised.209 Top-level Chinese leaders already saw these two facts as combining to pose a grave threat to China’s energy security as early as 2003.210 In the following decade, various interested parties continued to make

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208 “China’s Oil Industry Enters a New Era With the Trend of Energy Transitions,” NBR Brief for the Pacific Energy Summit June 2016, 2.

209 There are isolated Chinese analysts, such as Zhao Hongtu of the think-tank China Institute of Contemporary International Relations, who points out such concerns were overblown. Another one is Zha Daojiong. On this subject, he said “there has not been a single known major incident of deliberate interruption since the early 1990s, making such issues primarily psychological.” See Jonathan D. Pollack, “Energy Insecurity with Chinese and American Characteristics: implications for Sino-American relations,” *Journal of Contemporary China* 17-55 (2008): 234-236.

210 Then Chinese President Hu Jintao reportedly coined the term the “Malacca Dilemma” to describe what the central leadership saw as both an energy and an economic security issue in a Chinese Communist Party economic work conference in November 2003. His speech was clear to implicate the United States as a major source of the threat: “…certain powers have all along encroached on and tried to control navigation through the strait.” See Marc Lanteigne, “China’s Maritime Security and the ‘Malacca Dilemma’,” *Asian Security* 4-2 (2008): 144. Kong discussed the “wake-up call from the 9/11 terrorism attack and the U.S. invasion of Iraq” as the events that “catalyzed the formation of China’s international petroleum policy” while “three groups of agents” within China brought the awareness of the country’s petroleum security challenges to the central leaders. These three groups include the “policy-making community” such as the three barrels and the various ministries and central level academies (think tanks), the academic community, and the mass media. It is very plausible that some securitization took place along the way. See *China’s International Petroleum Policy*, 48-56.
use of this external context to highlight the fact that relying on international markets alone cannot ensure China’s oil supply security.

In the 2012 CNPC Economics Research Institute article quoted above, two of the measures to increase oil supply security discussed are related to this external context. One is to develop new “strategic passageways” to correct China’s “over-dependence” on oil from the Middle East that has to pass through “the Strait of Malacca and the Strait of Hormuz.” China’s “One Belt, One Road” initiative to improve both overland and maritime connectivity between China and the rest of Eurasia makes perfect sense viewed in this light. Two is to strengthen “military planning on energy security” such as “the defence capability along energy shipping routes.” The underlying message is that with all these geostrategic complications, NOCs, unlike private firms, can be relied on to take China’s national security interests into account even when pursuing but also “foregoing maximum” profits in their overseas oil projects if needed.

The strong military and geostrategic implications of this external context resulted in many in the “policy-making community” other than NOCs to engage in its securitisation. Liu Xuecheng of the Ministry of Foreign Affairs think tank, China Institute of International Studies, for example, said in 2006:

> [F]rom China’s perspective, domestic energy strategy is rooted in the vulnerability of its access to external energy resources and defensiveness against the United States curtailing its energy supplies. Considering the [potential] vulnerability of the four-fifths of all Chinese imports that pass through the Strait of Malacca, China sees its maritime shipping security as a pressing priority.

The defence establishments, especially the navy in this case, are natural securitising agents regarding this particular external context. Jonathan D. Pollack documented Chinese naval officers’ writings advocating “heightened development of maritime capabilities to ensure long-term power and prosperity of the state” in the early to mid-2000s. This kind of securitising continues to the present day. In an appearance on the China Central Television in June 2016, Rear Admiral Yin Zhuo, Director of the PLA Naval Informatization Expert Consultation Committee, opined that the reason behind the

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212 Ibid., 67.
213 This idea was expressed by a confidential interviewee working in one of the three barrels in Beijing in May 2015. Both this and another confidential interviewee working in an NOC, however, stressed that profits or economic considerations have been a major, if not the greatest, concern of NOC operation. NOC’s active participation in and indeed benefiting from the international markets does not mean that they did not also engage in selective securitising or powerful lobbying at the same time.
United States deploying littoral combat ships in Singapore was to control the Malacca Strait and possibly block it because the “Malacca Strait is the lifeline of petroleum shipping, foreign trade, and economic development of China.”

China’s relatively negative relationship with the United States apparently was securitised successfully by proponents of this approach to prompt top Chinese leaders to support Chinese NOCs’ overseas expansion and other oil diplomacy effort since the early 2000s. These strategic oil supply measures appear to be evidence that the Chinese state was risk averse and lacked trust in the long-term reliability of the international oil markets. Not only did India had a better relationship with the United State during the same decade, geography also relieves it of any “Malacca Dilemma,” if not concerns about shipping security through the Strait of Hormuz or the pirate-ridden coast off Somalia. China, therefore, deserves the lower external context trust score it receives in the preliminary study. In fact, it is argued here that China’s reaction to this external context seemed so extreme that its overall trust level in the oil markets deserves to remain in the lowest trichotomous level (and numerically lower than India’s as in the preliminary study) even though Chinese NOCs’ displayed less rigorous public securitising effort than Indian NOCs.

3.4 Implementation Capabilities of China

China had a considerably higher overall capability to implement strategic oil supply measures than India in the years leading to 2013 according to preliminary analysis. Similar to the method used in the comparison of India and Thailand, the profitability of Chinese NOC and China’s oil diplomacy capability are examined in this section as additional measures of its overall implementation capability. As the following analysis shows, the conclusion is that China’s capability to implement strategic oil supply measures deserves to be a trichotomous level higher than that of India’s.

3.4.1 Chinese NOC Profitability

The “three barrels” and other minor NOCs operating in China were not publicly traded, unlike in India and Thailand. Still, their profitability was an appropriate additional measure of their financial capabilities independent of that of the Chinese state. The “three barrels’” subsidiaries had been traded in major international stock exchanges for more than

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217 See footnote 221.
a decade prior to 2013. Their profitability greatly impacted that of their parent companies which held the majority shares. More importantly, the state had given its NOCs great operational autonomy throughout the country’s petroleum sector reforms over the last three decades. Even if China’s government were to decide to scale back the robust resource supplier role it had been playing either by choice or by necessity, NOCs would still have the freedom to determine how to make use of the profits they and their subsidiaries generated.\textsuperscript{218}

The combined five-year average (2009-2013) of the net profit of PetroChina, Sinopec Corp. and CNOOC Ltd. was more than six times higher than that of Indian NOCs of the same period.\textsuperscript{219} Those of their parent companies are not counted in this study since it is not entirely clear if the amounts provided in the three-barrel annual reports have already included those of their subsidiaries. In any event, six times higher net profits should convincingly show that Chinese NOCs are more profitable even though China consumed about 2.9 times more oil than India in 2013.\textsuperscript{220} This means that Chinese NOCs had both more capital at their disposal in absolute terms as well as were proportionally more profitable. They definitely had a higher capability to finance projects and adopt measures they saw fit independent of state support.

3.4.2 Chinese Oil Diplomacy Capability

Much has been written about China’s vigorous oil diplomacy since top Chinese leaders endorsed and indeed demanded NOCs and other SOEs to “go out” and engage in overseas oil investments and other energy-security related projects in the early 2000s.\textsuperscript{221}
Some of these efforts were done in concert with the investment projects in which Chinese SOEs and their subsidiaries overseas were involved, while others were more general in scope. An example of this latter category was efforts to enhance relationships with Indonesia, Malaysia, and Singapore, the three littoral states of the Strait of Malacca, to prevent “any great power, especially the United States and Japan, from extending its military presence” to the Strait.222

Some studies, such as Meckling et al’s, compare the oil diplomacy efforts of China and India.223 They all seem to agree that the Chinese effort has been more robust.224 Displaying more aggressive oil diplomacy and engaging in it more frequently can be interpreted either as proof of China adopting a higher level of strategic oil supply measures as defined here or as its higher implementation capability of those measures or both. In this comparative study, as in the comparison between India and Thailand, the specialty of and financial support to pertinent Chinese agencies are examined to investigate China’s oil diplomacy capability, which in turn is hypothesised to result in the adoption of strategic oil supply measures.

China spent less to maintain its Ministry of Foreign Affairs (MFA) than its Indian counterpart in absolute terms and especially as a percentage of its GDP between 2009 and 2013 according to publicly available official budgets.225 Unlike its Indian counterpart, the Chinese MFA did not have a department which name suggests specialisation in energy related matters.226 It appears that oil diplomacy functions are scattered over a number of subordinate departments, such as the Department of International Economic Affairs Department and the Department of West Asian and North African Affairs. The OPEC is one of the regional “cooperation organizations” which relationship with China is managed through the latter department. The Chinese MFA, however, likely has unpublicised groups

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222 Kong, China’s International Petroleum Policy, 131. Kong lists many other Chinese oil diplomacy efforts beyond those directly involving NOCs, such as ports and other infrastructure projects overseas that may help secure oil transportation on pages 129 to132.
223 Some other examples include: Carl, Rai, and Victor, “Energy and India’s Foreign Policy”; Powell, “Geo-politics of India’s equity investments in energy.”
224 This does not mean that the authors think the efforts were necessarily more effective in ensuring oil supply security.
225 The five-year average of the Chinese MFA budgets is US$991.73 million versus Indian MEA’s US$1,233.54 million during the same period (already minus the budget of foreign aid and loan). The Chinese MFA budget does not include foreign aid, which was listed in the Chinese Ministry of Commerce (MCOM) budget. The sources for these figures are all from the official websites of the respective ministries. This only amounts to 0.013% of Chinese GDP in the same period whereas the Indian MEA budget was 0.07% of its GDP. For detailed calculation of the Chinese MFA budgets, see Table A15, Appendix C.
or personnel that wielded great authority over China’s conduct of oil diplomacy. 227 As pointed out in the last section, oil supply security had been elevated to a major concern of China’s top leaders soon after this century began.

In addition to the Chinese MFA, the Chinese (MCOM) also undertakes functions that may be considered as oil diplomacy, such as formulating international trade and economic cooperation development strategies and policies. 228 It also contributes considerable funds to such functions by footing bills incurred by “economic and commercial organization personnel stationing in overseas consulates.” 229 For these reasons, the part of the MCOM budget these functions are assigned is also included in the calculation in this comparison. 230 Even after this addition, China still spent less on foreign affairs and international trade related functions during the period studied than India. 231 In fact, the average annual amount China spent as a percentage of its GDP was 4.67 times less than that by India. 232 The MCOM, like the MFA, does not have a department with a name that suggests specialisation in promoting energy or oil investments or trade.

How can this lower government spending and apparently greater oil diplomacy capability of China be reconciled? There are a number of logical explanations. First, similar to the situation of China’s supposedly grossly under-reported official defence budget, the budgets of the two Chinese ministries examined here might actually be much larger. Still, according to an American think tank report, even the highest outside estimate made was less than double the official Chinese defence budget in 2015. 233 If we assume the situation applies here, China’s spending on the two ministries with obvious oil diplomacy functions

227 For updated accounts and analyses of China’s extensive conduct of oil diplomacy while balancing its overall relations with the United States, see David Zweig and Yufan Hao, ed. Sino-U.S. Energy Triangles: Resource Diplomacy Under Hegemony (New York: Routledge, 2016), especially Chapters 3 to 12.


229 This is listed as an explanation of the expenditure under the category of “overseas organizations” in the MCOM budget. See “Year 2013 Final Accounting of the Ministry of Commerce of the People’s Republic of China,” MCOM website. Accessed 2 January 2017, [中华人民共和国商务部, 商务部 2013年度部门决算]

230 Similar to the exclusion of India’s foreign aid and loans in the Indian MEA budget, the foreign aid part of the MCOM budget is not included in the calculation.

231 The combined annual average of the relevant budget items of these Chinese ministries was US$1,125 million versus India’s US$1,233.54 million. See Table 15, Appendix C for detailed calculation.

232 China spent about 0.015% of its GDP versus India’s 0.07%. See Table A15, Appendix C for detailed calculation.

would be slightly higher than India’s in absolute terms, but still much less proportional to its GDP.

A second explanation is that the source of China’s oil diplomacy capability was as much from positive support the government provided as from the lack of procedural and other restraints it placed on ministry officials as well as NOC and other SOE executives. This is the conclusion of Meckling et al’s study as well as anecdotal complaints by Indian NOCs when engaged in bidding wars with Chinese NOCs in overseas investment projects. Third, China simply derived greater intangible capability that comes with its UNSC permanent membership as well as with its larger economy and denser trading relationships with foreign countries.

Fourth, there was other not-so-obvious oil diplomacy related Chinese organizations and agencies, most notably banks, that boosted NOCs’ overseas investment capability with no comparable counterparts in India. According to Erica Downs’ estimate, Chinese state-owned banks made US$74.6 billion “energy-backed loans” to NOCs and governments of oil exporting countries between 2005 and 2010. This, in turn, speaks to the 13 times more foreign exchange reserves China had over India, which has been taken into account in the preliminary study. Finally, a plausible but not probable factor: China actually did not have a higher capability than India, contrary to the conclusion of all known studies that examine the two countries’ oil diplomacy activities.

The truth likely is a mixture of all the above explanations, except possibly the last one. When all the sources of capabilities examined in this study and the preliminary analysis are viewed in totality, China’s overall implementation capability of strategic oil supply measures would still be at a higher trichotomous level than India’s. This would still be true if we assume Chinese oil diplomacy capability was actually more or less the same, not vastly superior than that of India as commonly assumed.

4. Conclusion

The in-depth comparison between India and Thailand with data from the years leading to 2013 confirms that they adopted a similar level of strategic oil supply measures.

234 Inside China, Inc.: China Development Bank’s Cross-Border Energy Deals (Washington, D.C.: John L. Thornton China Center, Brookings, 2011), 39. Also see this study for details of these oil-for-loans deals financed by the China Development Bank and the Export-Import Bank of China, and executed through CNPC and Sinopec.

235 Downs stresses that the realisation of these deals does not mean that the Chinese state actively tried to push either the banks or NOCs to pursue them all the time and these entities engaged in these deals for a variety of reasons, including importantly to pursue profits. This conclusion does not diminish the fact that Chinese state-owned banks’ ability to make such large loans is a testament to the superior material capability of China in the short to medium term (if not its long-term financial health. See more discussion on the historical risks associated with artificially low interest rates to a particular sector in footnote 89 in Chapter Three).
Their OV levels, the overall strengths of private capital in their economies, their overall trust in the oil markets, and implementation capabilities all fell within the same trichotomous level during that period. These conditions again match those proposed by H1 of the vulnerability-interaction model as in the plausibility probe. Applied in a cross-economy situation such as this comparison, H1 suggests a causal pathway in which different net oil importing economies would end up adopting very similar levels of strategic oil supply measures during the same period. This pathway is that the levels of the four explanatory factors hypothesised by the vulnerability-interaction model of the two economies are very similar.

This does not mean that the magnitudes of all the variables of India and Thailand were exactly the same. Viewed in totality with the more cursory data examined in the preliminary study, India “caught up” in the magnitude of its intervention in its petroleum sectors in the form of the country’s more market-displacing oil product pricing regime. This, however, began to change with the deregulation of diesel prices in 2014. Private capital, but only in the form of international private capital, was even stronger in Thailand, especially in the petroleum sectors. There is no sign, however, that state capital in the form of SOEs, will be in the retreat any time soon.236 The differences between the two economies in the other three variables remained very slight, with India having a little higher OV, a little lower trust, and a little higher capability. Considering the great differences between the two countries in many other respects such as population, geographical size, political and economic systems, I argue that H1 passes the test of the most different research design.

The in-depth comparison of China and India with data from the same period confirms that China adopted a level of strategic oil supply measures and had a capability to implement them that were trichotomously higher than India’s. At the same time, their OV levels, the overall strengths of private capital in their economies, and their overall trusts in the oil markets all fell within the same trichotomous level. These conditions match the conditions stipulated and the outcome expected by H2 as in the plausibility probe. Applied in a cross-economy situation, H2 suggests one causal pathway that explains the variation in the levels of strategic oil supply measures adopted by different net oil importing economies during the same period.

Upon examination of more detailed data in this comparison, China seems to have adopted an even higher level of strategic oil supply measures in the form of international oil

supply investments through its NOCs and a very restrictive upstream oil sector. China’s overall implementation capability was also higher because of its more profitable NOCs. While the magnitudes of China and India’s other explanatory variables were similar, China’s private capital appeared weaker than India’s, especially in the petroleum sector. China’s OV and overall trust in the oil markets were slightly lower. As detailed in Chapter Three, H2 derives from the most similar research design. The similarity between China and India in many aspects in addition to the three hypothesised variables accentuates the explanatory power of the variable that was markedly different – their implementation capabilities.

The two in-depth comparisons presented in this Chapter further support the validity of the vulnerability-interaction model. As discussed in Chapter Three, there are not many alternative theories that are specified enough that cover the geographic scope of this project. Due to the configurations of the variable levels of these particular case studies, the option to compare the validity of vulnerability-interaction model with alternatives is further limited.

The India-Thailand case is a case of no substantial variation in any of their variables’ levels. The structural realist/geopolitical perspective would also explain the similarity of the levels of strategic oil supply measures they adopted by their similar capabilities and OV levels. This perspective would also explain China’s higher DV with its higher capability and illuminate our understanding of its slightly lower OV with its much higher capability.

A conclusion that emerges from the data in this Chapter supports the proposition in Hughes’ study that when a domestic oil firm has grown to a size that is near parity with IOCs, it would behave more like them, meaning calling for a more liberalised governance of the country’s petroleum sectors. The sizable Indian private oil firm Reliance has shown signs of doing just that.237 While the subsidiaries of Chinese NOCs were even closer to parity in strength with IOCs than Reliance, they were still tightly controlled by their parents, which enjoyed overwhelming dominance in the domestic market through strict entry barriers. It is, therefore, unsurprising that subsidiaries of the “three barrels” have not clamoured for further liberalisation of the Chinese oil sectors.

Chapter Five
Taiwan’s Pathway to High-Level State Intervention in Oil Supply

1. Introduction

Why do some net oil importing economies continue to adopt a high level of strategic oil supply measures decades after crude oil and oil products began to be freely traded in international oil markets? This appears to be especially difficult to explain in economies that are generally free and open. To better understand this phenomenon, this chapter investigates the case of Taiwan in the years preceding 2013 as a deviant case of H3.

As detailed in Chapter Three, H3 of the vulnerability-interaction model proposes a causal pathway to the adoption of a high level of strategic oil supply measures by economies in which private capital generally have a significant level of strength (three-high cases). Specifically, the pathway stipulates a high oil vulnerability (OV), a high level of private capital strength, a high implementation capability, and a medium level of trust in the oil markets. None of the nine case-study economies, in the preliminary study, however, match all these conditions. Taiwan’s conditions circa 2013 appear to be the most promising among the initial case studies to offer an answer to the question despite its apparent deviance to some stipulations in the vulnerability-interaction model as it is currently formulated.

Data presented in this Chapter suggest that not having an overall high level of trust in the oil markets to ensure uninterrupted and affordable oil supply at all times is the most critical condition that makes generally open and free economies continue to adopt a high level of strategic oil supply measures. While these economies may have a high financial capability to implement a high level of these measures, they may not have a “high capacity,” as expounded by Ikenberry, to free themselves from interventionist commitments of an earlier era.¹ Not having a high level of trust in the oil markets due to securitisation facilitated by these polities’ domestic and external contexts makes decision-makers more risk averse. They are hence less resolute in pursuing their larger goal of economic liberalisation in the supposedly more strategic domain of oil supply.

The rest of this Chapter proceeds by first presenting a synopsis of the politics of oil in Taiwan, then by re-assessing in greater depth the accurate level of each variable of the vulnerability-interaction model. Situations unique to Taiwan are introduced and analysed through the prism of the framework of the model. The concluding section synthesises the

¹ These may include, for example, long-established NOC(s) and artificially low oil product pricing. Ikenberry’s short definition of state capacity is “the differential ability of states to assert control over political outcomes.” See, “The Irony of State Strength: Comparative Responses to the Oil Shocks in the 1970s.” International Organization 40-1 (1986): 106.
information presented to provide a comprehensive understanding of the pathway to Taiwan’s adoption of a high level of strategic oil supply measures around 2013.

2. Politics of Oil in Taiwan

Taiwan’s oil industry was dominated by its NOC for the first four decades after the end of the second world war as it had the monopoly to operate in most aspects of the industry. Taiwan’s oil sector has gradually liberalised since the late 1980s. The domestic private firm Formosa Petrochemical Corporation (FPC) was established in 1992 to participate in the newly opened-up oil sector. FPC has since formed a duopoly with the NOC in Taiwan’s mid- and downstream oil sectors. Oil product prices began to be deregulated in 1993. However, repeated government “stabilisation” of domestic oil prices since and other regulatory issues have mostly discouraged international oil companies from entering Taiwan’s oil market up to 2013.

Taiwan’s NOC has continued to be the only player in the economy’s very small upstream petroleum sector, even after it theoretically lost the monopoly in oil exploration and production (E&P) after 2003. The government’s clearly articulated goal of NOC divestment has so far been thwarted by the labour union and other interest groups. It remained 100 percent state-owned and simultaneously acted as the industry administrator throughout the period studied. Taiwan’s diplomatic isolation and precarious geopolitical position have created a more pertinent backdrop for parties with vested interests to securitise oil supply to the island.

All these appear to contribute to continued heavy government footprints in Taiwan’s oil supply while private investments have been more unfettered in many other sectors in the economy. The conditions of Taiwan did not totally correspond to those stipulated in H3 which proposes to explain this puzzling phenomenon. Verifying Taiwan indeed adopted a high level of strategic oil supply measures during the period studied is the prerequisite for unearthing the pathway leading to their adoption and in refining H3. The rest of this section endeavours to accomplish this.

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2.1 Taiwan’s Strategic Oil Supply Measures

Among the three economies the preliminary study determines to have adopted a high level of strategic oil supply measures in 2013, Taiwan has the lowest composite score, which is made up of the government’s control of crude oil supply to the economy, typically through an NOC, and the size of any petroleum reserves held by government entities. These two aspects of state intervention in Taiwan’s oil supply, therefore, are appropriate to constitute this chapter’s initial analysis.

2.1.1 Government Control of Crude Oil Supply

The Taiwanese government has been “controlling” crude oil supply to the economy through its wholly-owned and vertically-integrated NOC CPC Corporation (CPC) for decades. The last major aspect of CPC’s monopoly in Taiwan’s oil sectors, that of crude oil import, however, ended in 1999 when FPC imported its first load of crude oil to the island. The gradual liberalisation of the governance and various oil sectors in Taiwan began in 1987. At that time, private gas stations were allowed to sell gasoline and diesel. In 1996, private firms were allowed to “produce, market, and import/export petroleum products.” CPC and FPC have since formed a duopoly in the domestic mid- and downstream oil sectors except for a brief “intrusion” of an international firm (Esso) in 2002-2003.

Taiwan’s NOC CPC imported about 44 percent of the oil consumed in the economy in 2013. This was less than half of Indonesia’s 100 and China’s 99 percent respectively, and was on par with India’s 45 and Thailand’s 42 percent respectively for the same year. These numbers seem to be an accurate reflection of the hybrid NOC ownership and domestic petroleum sector governance and pricing regime of Taiwan among these economies. Like Chinese and Indonesian NOCs, CPC was and still is wholly-owned by the government. To be precise, it was a subordinate organization of the Republic of China (ROC) Ministry of Economic Affairs (MoEA). Despite its name of a “corporation,” it has not been

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4 Indonesia scores the highest, followed by China. See Tables 3.4 in Chapter Three.
5 The name of the same company went from “China Petroleum Corporation” when it was founded in Shanghai in 1946 by the Republic of China government to CPC Corporation, Taiwan in 2007. CPC was relocated to Taiwan with the nationalist government in 1949. See CPC Corporation, Taiwan 2014 Annual Report, 4.
7 Wu et al, “Effect of floating pricing policy,” 4236.
8 Ibid.
9 Ibid. There is more discussion of this in the Section 4.1 below.
10 See Table 3.2 in Chapter Three. “[O]nly an extremely small amount” of crude oil CPC fed its refineries was “produced in Taiwan.” CPC Corporation, Taiwan 2014 Annual Report, 12.
11 See Table 3.2 in Chapter Three.
corporatised or listed in the domestic or any other stock markets as in the cases of Indian and Thai NOCs. Unlike the Chinese or Indonesian cases, however, CPC formally lost its monopoly status in all the oil sectors when the Petroleum Administration Act came into effect at the end of 2001.¹³ CPC did not have any publicly-listed subsidiaries like the Chinese “three-barrel” NOCs.

Also unlike the Chinese and Indonesian cases, CPC was and still is slated for privatization. In fact, it was among the first wave of state-owned enterprises (SOEs) in Taiwan that were chosen to go through the process in 2001.¹⁴ The process has stalled for reasons that will be explored in Section 4.2 below. Still, in the years leading to and including 2013, the goal of privatising CPC was repeated in each of the Energy Bureau of MoEA annual reports in the context that many of the sector administrative functions would be taken over by the bureau when that goal eventually materialises.¹⁵

As it stood in 2013, however, CPC was both a major oil sector operator and the petroleum administer tasked with such functions as the management of retail gas stations, the general management of the oil market, ensuring the safety of the oil and gas industries, and the administration of the petroleum fund and oil subsidies stipulated in the Petroleum Administration Act.¹⁶ Some of these functions obviously put CPC in apparent conflict-of-interest situations as it was one of two major oil sector operators in Taiwan. As the discussions below reveal, CPC was placed in loss-incurring situations. By contrast, Chinese or Indonesian NOC(s) were not saddled with such administrative functions officially during the same period.

Taiwan basically has had a free-floating oil pricing regime, but that regime had been “tinkered” with a number of times since the government took the first step of price decontrol in 1993.¹⁷ The most recent “price stabilisation” effort by the government was gradually and haltingly lifted since April 2012, which returned gasoline and diesel prices to be largely determined by supply and demand dynamics.¹⁸ Even after product prices floated again,
subsidiaries given to an array of groups in the Taiwanese society continued. These included mass transit operators and taxi drivers, agricultural and fishing sector operators, people with disabilities, and people living in aboriginal mountainous areas and outlying islands. The subsidies were financed with the petroleum fund, levied as fees on oil refiners, importers and exporters, as well as distributors across the board. Taiwan’s petroleum fund has played more extensive roles than Thailand’s oil stabilisation fund, one of which is to create and maintain the second strategic oil supply measure examined in the preliminary study – stockpiling of oil.

2.1.2 Strategic Petroleum Reserve

The Taiwanese government decided to establish a strategic petroleum reserve (SPR) in 2001 to “stabilise domestic petroleum supply.” The Taiwan Research Institute, a “privately-funded” but publicly-oriented think tank “operated by academic elites,” was tasked to administer the SPR. The Petroleum Administration Act stipulates that the government has to keep 30 days of oil consumption. The government completed stockpiling 2,830,000 kiloliters of oil in 2007, which was “no less than the equivalent of 30 days of the needs of the economy,” about 57% of which was in the form of crude oil and the rest in the form of oil products. In addition, all oil refiners and importers operating in Taiwan must stockpile the equivalent of 60 days of the average amount consumed in the economy in the previous 12 months, pro rata to their share of the market. Refiners also have to stockpile a minimum of an additional 50,000 kiloliters and importer an additional 10,000 hike, but would only fall halfway when prices came down until it recuperated all the losses previously incurred. See Bureau of Energy, Ministry of Economic Affairs [ROC] 2012 Annual Report, 33. This rationalisation was eventually aborted and was reinstated in October 2013 due to negative public comments on the policy. See Huei-Chu Liao and Shi Ting Jhou, “Taiwan’s Severe Energy Security Challenges,” Brookings Institute website, September 2013, accessed February 27, 2016, http://www.brookings.edu/research/opinions/2013/09/12-taiwan-energy-security-liao.


21 In addition to the two functions mentioned, the fund was also tasked to promote oil and gas E&P, energy policy research, R&D of oil exploration and alternative energies, and other measures “necessary to stabilise oil supply and maintain the order of the oil product market.” Petroleum Administrative Act, Chapter Six, article 36. More detailed explanations are given to these functions in the three subsequent amendments to the Act, the last of which was in January 2011. See the Taiwanese government posting the texts of the amendments in the following official website, accessed 5 January 2017, http://www.ey.gov.tw/Upload/RelFile/2016/661383/eac9f7af-1522-4b2a-81a2-3c716d37680f.pdf.


24 “Management Services of Government-Owned Petroleum Reserves.”

kiloliters.26 Both the NOC CPC and the private firm FPC must comply with this Act and in fact must report their stockpiling amount to the Energy Bureau weekly and be subjected to irregular inspections.27

Taiwan, therefore, maintained a SPR equivalent to at least 90 days of its oil import according to the definition of this study and since the government completed its own stockpile in 2007.28 It scored the highest among the three economies receiving an overall high level of DV in the preliminary study for this more market-conforming strategic oil supply measures.29 In fact, Taiwan had the largest SPR size among all nine-case economies except South Korea in 2013.30

2.1.3 Overseas Oil Supply Projects

Apart from these two strategic oil supply measures examined in the preliminary study, the Taiwanese government also adopted measures investigated in the comparative studies in Chapter Four. CPC, through its subsidiary Overseas Petroleum and Investment Company (OPIC), did engage in overseas oil supply investment projects during the period under review.31 As of the end of 2013, CPC was engaged in 25 overseas oil and gas E&P projects in 10 countries, 13 of which were already hydrocarbon producing.32 Some examples include Blocks 16 and 17 in Ecuador, Indonesia’s Sanga, Niger’s Agadem, and the Hurricane Creek project in Louisiana, U.S.A., producing 5.45 million barrels, or about 1.7 percent of the economy’s consumption of oil that year.33 These efforts yielded similar results

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26 Ibid. Some commentators have raised doubts of the compliance of these stockpiling stipulations by companies, but without concrete proof of otherwise, this project would use these official figures.
27 Ibid.
28 Since Taiwan had almost a 100% oil import dependency during the period studied, the amount of consumption was basically the same as the amount of import.
29 China had 17 and Indonesia had 47 days equivalent of SPR in 2013. See Table 3.3 in Chapter Three.
30 South Korea’s SPR was the equivalent of 122 days of import in 2013. Ibid.
32 CPC Corporation, Taiwan 2014 Annual Report, 8.
in recent years. In 2008 for example, CPC received 5.89 million barrels of equity crude from its overseas projects. These results were of a much smaller scale proportionally than the overseas hydrocarbon yields of Chinese NOCs, but larger than Indonesia’s in 2013, the other two case studies the preliminary study determined to have adopted a high level of strategic oil supply measures.

2.1.4 Preferential Hydrocarbon E&P

Taiwan has had almost no hydrocarbon resources left within its territories to speak of in the last two decades. At first glance, therefore, the measure of preference given to NOCs in indigenous oil development does not seem applicable. In fact, it does in a de facto, not a legal, way. One of the statutory functions of the Taiwanese petroleum fund mentioned earlier is to “encourage domestic [petroleum] sector operators to engage in oil and gas exploration and development work domestically and overseas.” The maximum subsidy was 50 percent for exploration projects and 12 percent for development projects, presumably of the project costs. These subsidies do not give preference to the NOC, but to all domestic operators. This is in line with stipulations in the Mining Act which allows all ROC people to apply for the right to explore and produce minerals, including oil and gas, “within the territories, special economic zone, and continental shelf of the ROC.”

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34 CPC Corporation, Taiwan 2009 Annual Report, 12 [2009台灣中油股份有限公司年報]. For a detailed breakdown of all CPC overseas hydrocarbon projects, including the equity shares and production amounts of each, see Bureau of Energy, Ministry of Economic Affairs Annual Reports of the years studied under the chapter on Petroleum Industry.

35 As reported in Chapter Four, the largest Chinese NOC CNPC produced 35.5 million tons of equity oil and gas in 2013. CPC’s figure would be higher than the 5.45 million barrels (or 0.74338 million ton) cited here since it also produced 351 million cubic meters of natural gas in that year according to the same annual report. Even generously doubling the CPC figure means it only produced about 3.5% of Taiwan’s oil consumed whereas the figure of CNPC alone equaled to about 7% of the oil China consumed that year. This has not even included the production of the two smaller “barrels.”


38 The texts specifying these percentages were a little ambiguous if these percentages pertain to the total project costs. Ibid. These percentages have not changed over the years. They had been the same from at least 2007 on. The sources are the same Bureau of Energy annual reports. The Petroleum Administration does not specify these percentages.

39 According to the constitution and the amended ROC Mineral Act of 2003, which covered the period studied, the ROC government has ownership of all mineral rights on and off shore of Taiwan, but “people of ROC” can apply for the right of exploring and producing almost all minerals, including oil and gas. See Meng-yu Hsieh, “Introduction to Our Country’s Mining Laws,” Taiwan Bar Journal 19-12 (2015), 19. [謝孟羽,我國礦業法制之初探,全國律師,第 19 卷 第 12 期]. The English translation of the current version of the Act, amended in 2016, uses the term “natural or juridical person of ROC,” which suggests corporations registered in ROC can also apply for mining rights. This appears to open up the possibility of foreign-owned parents of ROC corporations to apply for oil and gas E&P. The Chinese versions of the current Act as well as the 2003 version simply use the
The ROC government established five offshore hydrocarbon mining regions in 1970.⁴⁰ At the same time, due to the capital- and especially advanced technology-intensive nature of offshore E&P, the government also endowed CPC with the right to exploring and producing the resources either by itself or in cooperation with foreign companies.⁴¹ After the 2003 amendments to the Mining Act, not only on and offshore oil E&P were opened to all domestic operators, the government no longer drew up fixed E&P blocks for applicants to engage in their business. Instead, applicants could draw up their proposed exploration areas and plans for approval.⁴² Still, this amendment was not retroactive and it contained a sunset clause which let CPC receive the priority to apply for hydrocarbon E&P rights in projects in which it had already been engaging. These included offshore projects in its first offshore petroleum E&P region.⁴³

The road of CPC’s offshore hydrocarbon exploration was long and torturous, which serves as an illustration of the systemic changes and geopolitical situations Taiwan has been facing for the last few decades. These circumstances appear to have acted as an explanatory variable that impacted on all the other variables and will be explored further later in the chapter. For offshore hydrocarbon E&P, CPC has taken on a number of external cooperation partners, such as with CNOOC in the Taichao project, with Husky Energy in the Tainan Basin, and with CNOOC and Total in the Taiyang deep water project.⁴⁴

Between 2007 and 2013, the petroleum fund subsidies were awarded to 26 hydrocarbon E&P exploration projects to cover on average 40 percent of their costs.⁴⁵ Eleven of the approved projects or about 42 percent of them were in fact onshore or offshore domestic projects.⁴⁶ Two of them actually yielded natural gas. The one in Miaoli County began production in 2011,⁴⁷ while the Kuantien well in Tainan City and the Fengshan well

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⁴⁰ Tseng Hung-Chih, “Establishment of our country’s offshore oil E&P regions and cooperation with foreign companies to explore oil,” Mining and Metallurgy 56-3 (2012): 11. [曾弘志, 我國海域石油礦區之劃立及外資參與合作探油, 鑛冶 第五十六卷 第三期 中華民國一 O一年九月出版].
⁴¹ Ibid.
⁴² Ibid., 20.
⁴³ These projects originated in 1973 and were extended to 2013, could be extended for another 20 years. Ibid., 18-19.
⁴⁶ Ibid.
in Kaohsiung City were undergoing production assessment as of 2012.\textsuperscript{48} FPC, the only other crude oil importer in Taiwan during the period studied, received subsidies for two projects only. One was for the exploration of the Mowry block in central Wyoming, U.S.A. in 2007,\textsuperscript{49} and the other for the exploration of the Maverick Basin in Texas.\textsuperscript{50}

The fact that FPC, which had been a mid- to downstream company (refiner, distributor, and gas station operator), only set up an upstream subsidiary in the United States at the end of 2006, not its private company status, may explain its low rate of receiving the E&P subsidies.\textsuperscript{51} In addition, as the information from the last paragraph shows that whatever paltry hydrocarbon resources left on Taiwan seemed to be natural gas, not oil. Up until the passage of the Natural Gas Enterprise Act in February 2011, CPC played a monopolistic role in natural gas wholesaling and exploration.\textsuperscript{52} Still, all these factors converge to have created a de facto “preference” given to the NOC for E&P. Besides, the language of the law seemed to give actual legal preference to domestic oil companies.

The rationale of these government funded subsidies was made clear by the variants of the following sentence in all the Energy Bureau annual reports examined: “To control oil and gas at their sources and to increase the rate of self-developed oil and gas.”\textsuperscript{53} The use of the term “self-developed” is very similar to the way it has been used in Japan, another advanced economy in Asia almost totally devoid of hydrocarbon resources. Indeed, this whole idea of government subsidies to all domestic firms to develop oil and gas was similar to the Japanese government-guaranteed credits to finance Japanese oil firms for overseas oil and gas projects. The Taiwanese way was more direct and so more market-displacing, both in the measure’s administration and its actual execution through a vertically integrated NOC, the CPC. In spite of or because of that, the rates of “self-developed” oil by Japanese firms were a few times higher during the period studied.\textsuperscript{54}

In sum, this section shows that the Taiwanese government indeed continued to play a large role in the supply of oil to the economy in the years leading to 2013, despite its stated

\textsuperscript{54} The Japanese average appears to be between 10 to 12 percent (see footnote 49 in Chapter Three for details of sources of this figure) while the Taiwanese figure is estimated to be about 2 percent. See discussions earlier in this section.
goal of and actual steps taken to liberalise the petroleum sectors more than a decade earlier. It adopted a high level of strategic oil supply measures, ranging from the most market-displacing one of complete ownership of a vertically integrated NOC with many sector administration functions to the less market-displacing oil product pricing and E&P subsidies policies to the more market-conforming, but still government-owned SPR. With the premise of Taiwan case study established, the following sections delve into the possible causes of this high level of intervention.

3. Taiwan’s Oil Vulnerability

The causal pathway leading to the adoption of a high level of strategic oil measures as suggested by H3 stipulates an economy to have a high level of OV. This is one of the apparently “deviant” explanatory variables of Taiwan. The preliminary study determines that Taiwan’s OV only reached a trichotomously medium level in 2013. In this section, Taiwan’s OV is investigated to verify its level. The same two additional measures examined in the comparative studies in Chapter Four, one for market risk and one for supply risk, are calculated for Taiwan.

Using the same method of calculation, the 2013 oil intensity of Taiwan’s economy was 0.047.\(^{55}\) This was higher than China’s 0.031 and India’s 0.027, but lower than Thailand’s 0.050.\(^{56}\) All three of these economies receive a low level of OV in the preliminary study, which did not take oil intensity into consideration. The same modified HHI index used in the comparative studies in Chapter Four is used to calculate Taiwan’s oil supply risk caused by the concentration and stability of countries of its crude oil supply in 2013, with the result of 89.57.\(^{57}\) This is slightly higher than India’s 87.24, but considerably higher than Thailand’s 68.94 and China’s 66.88 of the same year. Thailand would be able to somewhat “offset” the risk associated with its higher oil intensity with its lower crude oil source risk while India could do the opposite. Taiwan, however, was stuck with both a higher oil intensity and a high crude oil source risk in 2013.

Taiwan’s OV was certainly at least one level higher than China, India, and Thailand’s. The question was whether it was actually as high as the two economies

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\(^{55}\) The same BP Statistical Review of World Energy June 2014 is used as the source of Taiwan’s oil consumption. The data source for Taiwan’s 2013 figure is from “Real GDP at Constant National Prices for Province of China Taiwan,” Economic Research of [U.S.] Federal Reserve Bank of St. Louis website, accessed 3 January 2017, https://fred.stlouisfed.org/series/RGDPNATWA666NRU. Again, as in Chapter Four, the results represents ton of oil consumed/thousand US$ of GDP.

\(^{56}\) See Section 2.2 and 3.2 in Chapter Four.


The source of the country risks is from the same PRS Group report.
determined to have a high OV in the preliminary study, Japan and Singapore. Again, using the same method of calculation, Japan’s oil intensity was 0.046 and Singapore’s 0.157, while the concentration risks of sources of their crude oil supplies was 69.81 and 61.44 in 2013 respectively.\(^{59}\)

Singapore’s unusually high OV, especially oil intensity, as currently formulated, was somewhat exaggerated due to its high oil consumption figure relative to its small population.\(^{60}\) Oil trading and refining have been an important part of the Singaporean economy\(^{61}\) and a large portion of its crude import no doubt was to feed its outsized refining capacity relative to its population. With a population of just over five million in 2013, Singapore had almost 4.5% of refining capacity in the Asia Pacific, higher than Thailand’s 4%, which had a population of 67 million.\(^{62}\) The same situation also applied to Taiwan and South Korea to a lesser extent. Taiwan had 3.8% of the region’s refining capacity, but less than one third of Thailand’s population, while South Korea had 9.2% of the capacity and about three quarters of Thailand’s population.\(^{63}\) Thailand was not a country with unusually low refining capacity in the region either.\(^{64}\)

The OV of Singapore, South Korea, and Taiwan were only somewhat exaggerated because even if a portion of the oil they imported were used as raw materials to their export-oriented oil refining or petrochemical industries and not all for the basic needs or daily functioning of their populations their economies, these economies were still vulnerable to price volatility and supply disruption. The difference is that the burden of the risks would be distributed differently than in economies not so heavily dependent on such industries.


\(^{59}\) The same methodology and source of country risk is used. The source of their crude oil supply is from the same (as in China, India, and Thailand) MIT Economic Complexity Observatory project site. See footnote 38 in Chapter Four for more details.

\(^{60}\) It has the highest OV score among the nine case-study economies in the preliminary study, which is almost 23% higher than the score of Japan, the only other high DV economy.


\(^{63}\) Ibid.

\(^{64}\) Its population to refining capacity ratio in the region (1.95) is higher China’s (0.96), India’s (0.36), and Indonesia’s (0.44), but lower than Japan’s (3.34), Singapore’s (26.69), South Korea’s (5.91) and Taiwan’s (5.28). This is not a perfect measurement since only the 2013 population of the nine case studies, not all economies in the region are used for the calculation. These ratios would be even higher if the populations of the other economies are incorporated since their populations collectively would make up a higher percentage of the regional total than their collective refining capacity of 5.6%, according to *BP Statistical Review of World Energy June 2014*.
Japan’s OV score in the preliminary study is a little less than 10 percent higher than Taiwan’s.\(^65\) Its oil intensity was about the same as Taiwan’s, but its crude source concentration risk was about 22 percent lower in 2013. This would slightly narrow the gap between the two economies’ overall OV, but it does not appear that Taiwan’s OV would edge up enough to be classified as high in the Asia Pacific region even if the outlier case of Singapore is temporarily put aside. Japan’s higher ratio of oil-to-total primary energy consumption (44 versus Taiwan’s 39 percent), and its greater share of total global oil import (11 versus Taiwan’s 2 percent), are not likely to change soon.\(^66\) These are the two out of the four components of OV measures in the preliminary study that result in Japan’s higher OV than Taiwan’s.

Taiwan may, however, be considered an economy with a high OV on a global scale as the Asia-Pacific’s 27.7 percent oil self-sufficiency was much lower than any other region in the world.\(^67\) As Table 5.1 below indicates, the region that had the next lowest rate, North America, still produced over 76% of the oil it consumed. With the shale revolution in the United States, this rate goes up further in the years immediately after 2013:\(^68\)

<table>
<thead>
<tr>
<th>Year 2013</th>
<th>Oil Consumption (million tonnes)</th>
<th>Oil Production (million tonnes)</th>
<th>Oil Self-Sufficiency Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>170.90</td>
<td>418.60</td>
<td>244.94%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1,415.00</td>
<td>392.00</td>
<td>27.70%</td>
</tr>
<tr>
<td>Europe &amp; Eurasia</td>
<td>878.60</td>
<td>837.50</td>
<td>95.32%</td>
</tr>
<tr>
<td>Middle East</td>
<td>384.80</td>
<td>1,329.30</td>
<td>345.45%</td>
</tr>
<tr>
<td>North America</td>
<td>1,024.20</td>
<td>781.10</td>
<td>76.26%</td>
</tr>
<tr>
<td>South &amp; Central America</td>
<td>311.60</td>
<td>373.40</td>
<td>119.83%</td>
</tr>
</tbody>
</table>

Table 5.1 Oil Self-Sufficiency Rates in Regions of the World in 2013

The measures examined in this section so far suggest that Taiwan’s OV was between medium to high in years leading to 2013. Transit route risk, which is different from supply concentration risk, however, has not been be taken into account. As in China, this risk seemed to loom larger for Taiwan than many other economies in the region. The source of Taiwan’s anxiety about its oil transit routes, in contrast to China’s, appeared to originate from across the Taiwan Strait instead of across the Pacific Ocean. As in the case of China, however, any such worries had yet to be materialised, and so they fall in the realm of trust.

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\(^{65}\) Japan OV score, calculated with the four measures detailed in Chapter Three, was 38.8 and that of Taiwan was 35.36.

\(^{66}\) The data source of all these calculations is from *BP Statistical Review of World Energy June 2014*.\(^{67}\) Ibid.

\(^{68}\) It was 84.7% in 2014 and 87.84% in 2015. The source for the calculation is *BP Statistical Review of World Energy June 2016*, 9-10.
or belief, which will be further investigated in the section focusing on trust in the oil markets below.

4. Strength of Taiwan’s Private Capital

The only explanatory variable level that conforms to the stipulation of H3 for Taiwan in the preliminary study is that private capital in the economy is determined to have reached a high level of strength versus that of state capital in 2013. This conclusion was based on the high combined average economic freedom score Taiwan received. In fact, its score is the second highest among the nine case-study economies, 10 percent lower than Singapore’s but more than two percent higher than Japan’s, the other case-study economy that reached a trichotomously high level for this variable.

In this section, as in the comparative studies in Chapter Four, the historical-institutional and the actor-specific sources of private capital strength, especially in the petroleum sector as whole, are disaggregated and investigated separately to provide a more comprehensive and accurate picture of the overall strength of private capital in Taiwan in the years leading to 2013.

Many of the aspects that reflect the historical and institutional equilibria of the strength among international, domestic, and state capitals are already taken into account by the two “off-the-shelf” economic freedom indicators, which are also used in gauging the overall economic freedom of all the other case-study economies in earlier chapters. The following table, reproduced from a MoEA Investment Commission-funded report on Taiwan’s effort in attracting inbound foreign direct investments (FDI), provides three-economy comparisons of the economic freedom and competitiveness among Taiwan, Singapore, and South Korea between 2007 and 2013.

<table>
<thead>
<tr>
<th>Evaluation Organization</th>
<th>Evaluative Index</th>
<th>2007</th>
<th>2013</th>
<th>Change in Ranking 07-13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TA</td>
<td>SG</td>
<td>SK</td>
</tr>
<tr>
<td>IMD</td>
<td>World Competitiveness</td>
<td>18</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+7</td>
<td>-3</td>
<td>+7</td>
</tr>
<tr>
<td>WEF</td>
<td>Global Competitiveness</td>
<td>14</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+2</td>
<td>+5</td>
<td>-14</td>
</tr>
<tr>
<td>Heritage Foundation</td>
<td>Economic Freedom</td>
<td>29</td>
<td>2</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+9</td>
<td>-</td>
<td>+5</td>
</tr>
</tbody>
</table>

69 Singapore’s score is 86.65, Taiwan’s is 76.15 and Japan’s is 73.70. See Table 3.6 in Chapter Three.

The rankings shown on Table 5.2 suggest that on the whole, Taiwan’s institutional support to private capital has consistently improved in the seven years between 2007 and 2013 and should be in place for robust private economic activities in general in Taiwan by 2013.

The same four-scenario framework describing the domestic-international-capital-state balance developed in Chapter Two and applied in the comparative studies in Chapter Four is again used in this chapter to guide the investigation of the actor-specific source of private capital strength in Taiwan in the period studied.

### 4.1 International-Domestic-State Capital Balance in Taiwan

The strength of international capital was not high in Taiwan although there were generally few restrictions on foreign investments by the period studied.\(^{71}\) The ten-year (2004-2013) average of FDI inflow only made up of 3.55% of the economy’s gross fixed capital formation, a lot lower than the nine case-study average of 13.08%.\(^{72}\) This average is skewed by the unusually high percentage of Singapore (74.05%), but Taiwan’s number is still lower than 5.46% eight case-study average that excludes Singapore or the Asian average of 8.84%. In 2011 that percentage even turned negative, which means the FDI outflow was greater than the inflow that year. The only other case-study economy that experienced negative FDI inflow in that decade was Japan. Table 5.3 below summarises these findings:

<table>
<thead>
<tr>
<th>BERI Business</th>
<th>Risk Service</th>
<th>World Bank Doing Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 2 21 3 1 13</td>
<td>+3</td>
<td>+1 8</td>
</tr>
</tbody>
</table>

\(^{71}\) The “‘negative’ list of industries closed to foreign investment…[were] public utilities, power distribution, natural gas, postal service, telecommunications, mass media firms, and air and sea transportation.” See “2013 Investment Climate Statement,” U.S. Department of State website, February 2013. Accessed 2 February 2017, [https://www.state.gov/e/eb/rls/othr/ics/2013/204742.htm](https://www.state.gov/e/eb/rls/othr/ics/2013/204742.htm).

Surveys of foreign enterprises in Taiwan suggest that there has been a contradiction of strong institutional potentials for but lacklustre performance of foreign investments. This was a manifestation of the government’s active measures courting international capital and its simultaneous concern that overdevelopment of foreign firms would “squeeze the operation space of domestic firms.”\(^\text{73}\) In general, respondents of the surveys think Taiwan still exhibited a strong protectionist tendency, had a slow pace of decision-making and implementation, and too strict or insufficiently transparent laws and regulations.\(^\text{74}\) This is not an uncommon litany of complaints multinational corporations have against many host governments. Yet, the contradiction between the Taiwanese government’s declared guiding economic principle of liberalisation, including in the petroleum sectors, and its countervailing concerns seemed to be equally strong.\(^\text{75}\) Factors contributing to this contradiction are further discussed regarding the government’s liberalisation effort below.

\(^{73}\) Yang, et al., *Research and Analysis of Investment Trends – Research on Taiwan’s Strategies of Attracting Foreign Direct Investments*, 134.

\(^{74}\) Ibid.

\(^{75}\) In each of the Bureau of Energy annual report since 2007, for example, the goal of the bureau has been said to “actively push forward energy enterprise liberalization, privatization, opening up … the oil refining industry in response to major changes in energy policies as part of the economic development policy of internationalization and liberalization.” See for example page 2 of *Bureau of Energy, Ministry of Economic Affairs [ROC] 2013 Annual Report*. These goals, however, are not explicitly listed in the Petroleum Act of 2001 and its subsequently amended versions. Instead, article 1, Chapter 1 sounds like more “paternalistic” or “protective”: “The Petroleum Administration Act (henceforth the Act) is being instituted to promote the sound development of the oil industry, to safeguard the production and sales of oil, to ensure the steady supply of oil, to enhance people’s livelihoods, and to develop the national economy while at the same time give equal consideration to environmental protection.” See “Petroleum Administration Act,” Laws & Regulations Database of The Republic of China website. Accessed 12 January 2017, [http://law.moj.gov.tw/LawClass/LawAll.aspx?PCode=J0020019](http://law.moj.gov.tw/LawClass/LawAll.aspx?PCode=J0020019).
In the petroleum sectors, CPC and the domestic private firm FPC have been functioning as duopolistic operators since 1999. ESSO, a joint venture between ExxonMobil and a private Taiwanese oil terminal services company, Pan Overseas Corporation, entered the Taiwan oil market in 2002, right after the formal liberalisation of the sector. The supposedly liberalised domestic oil product pricing, however, was sometimes “tampered with” by the government price stabilisation effort via the CPC as discussed in Section 2.1 above. If private firms fail to match the low pricing of CPC, they would lose market shares. Without the advantage of having its own transportation and gas stations, Esso “phased out its Taiwan retail business in gasoline and diesel by the end of 2003.” No other foreign oil refiner, importer, or retailer was interested in entering the Taiwanese market since up to 2013.

Taiwan’s small upstream oil sector has been dominated by CPC as earlier discussions in this chapter has illustrated. Foreign oil firms or international capital were brought in as partners of CPC in the technology-intensive offshore E&P, but these projects had yet to produce any tangible yields by 2013. International capital was infused in Taiwan’s upstream oil sector in a significant way indirectly through joint venture overseas E&P projects with OPIC, CPC’s overseas arm. Such cooperation dated back to the 1970s in the Philippines and then in Indonesia, even before the establishment of OPIC. In recent years the exploration projects that actually yielded positive results concentrated in the United States.

This “participation” of international capital in Taiwan upstream sector did not bring it into direct competition with domestic private oil firms since there were almost no indigenous resources in Taiwan left for development. The hydrocarbon E&P subsidy system

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77 Ibid., 4235-4236.
78 Ibid., 4236.
80 All twelve overseas oil and gas-producing projects of OPIC listed on the Bureau of Energy 2013 Annual Report are joint ventures, with OPIC owning between five to 31% of the equity shares of them. See page 38 of the report.
82 Of CPC’s twelve oil and gas producing overseas blocks at the beginning 2013, nine of them were in the United States. See Bureau of Energy, Ministry of Economic Affairs [ROC] 2012 Annual Report, 38.
as it was implemented during the period studied and the ambiguity in the Mining Act on whether foreign firms were eligible to apply for onshore E&P pitted domestic private firms squarely against the NOC. The large capital requirement for upstream operations meant that so far only one domestic private firm, FPC, was competitive in this sector. Even without the edge CPC accrued from the sunset clause regarding offshore E&P, the huge technical and geopolitical complexities associated with hydrocarbon E&P off the coast of Taiwan were likely beyond the capability or interest of any domestic private firms.\(^{83}\)

In the mid- and downstream sectors, as mentioned earlier, there were no restrictions for foreign participation since 2001. As of 2013, however, there had been scant interest in either sector. One reason the American Chamber of Commerce in Taipei put forward was the energy usage review for energy-guzzling facilitates, including oil refiners, required by the Energy Administration Act.\(^{84}\) There were a relatively large number of domestic private firms in these sectors, but unsurprisingly not as refiners. As of the end of 2013, 204 companies obtained gas and diesel wholesaler licenses in Taiwan.\(^{85}\) None of the 227 companies on the current Bureau of Energy list appears to be foreign companies, and this situation likely has remained the same since Esso’s exit of the Taiwanese market.

In the retail sector, Taiwan had a total of 2,621 gas stations as of the end of 2013.\(^{86}\) This number, as the number of oil product wholesalers quoted above, however, suggests more competition than there was in reality. Most of these gas stations were either CPC or FPC franchises. While CPC directly operated 633 of them,\(^{87}\) FPC reportedly directly managed 133, with 525 affiliated entities. The remaining over 1,300 of service stations were CPC franchises.\(^{88}\) The duopoly, therefore, continued.

The dominant domestic private oil firm FPC had become rather strong by 2013. In 2012, it ranked as the third largest “refining and marketing” oil firm in the world on the IHS Energy 50 list, only dropping to the fifth in 2013.\(^{89}\) With a market capitalisation valued

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\(^{83}\) Taiwan’s offshore hydrocarbon E&P regions include areas of overlapping claims with China, South Korea, and Japan and have posed major hurdles in their development over the decades. There are more discussions of this issue later in the chapter.


\(^{87}\) Ibid.


\(^{89}\) “IHS Energy 50 – The Definitive Annual Ranking of the World’s Largest Listed Energy Firms, January 2014.”
at US$26.1 billion, the major criterion of the ranking, FPC did not rank within the world’s
top 50 energy firms. Yet, it was bigger than a number of major Asian refining and
marketing oil firms, including NOCs, such as SK Innovation of South Korea (ranked
seventh), India Oil (ranked eighth), S-Oil of South Korea (ranked 10th), Tonengen Sekiyu
of Japan (ranked 13th), and Bharat Petroleum of India (ranked 15th). FPC was definitely a
regionally significant petroleum player considering that Reliance of India was the only
private Asian oil firm that made it on the overall top 50 list in 2013 if the subsidiaries of the
Chinese “three barrels” are not counted.

It is, however, not easy to accurately judge the relative “strength” of FPC versus
that of CPC. CPC was not on the IHS list of top energy firms because it was not listed in
any stock exchanges and therefore difficult to independently verify its size and financial
situations. The English version of CPC 2014 and 2013 annual reports do contain sections
for financial statements which the company claimed to be compiling according to
international accounting standards. While CPC’s “Total Liabilities and Equity” were
about 80 percent higher than those of FPC in 2013 and 2012, its profit was less than one
eighth that of FPC in 2013 and its loss was almost 14 times bigger than FPC’s meagre profit
in 2012 (all before tax). In any event, the fact that the plausibility probe of this study finds
that CPC controlled a little less than half of the crude oil supply to the economy in 2013
seems to suggest the two companies were more or less in parity around that time in isolation
of other not as straightforward yardsticks.

What is certain is that state capital in the form of the vertically integrated NOC
CPC was more tenacious and stronger in the petroleum sectors than in many other sectors

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90 The 50th on that list, TNK BP, had a market capitalisation of US$29.8 billion. Ibid.
91 Ibid.
92 These subsidiaries are categorised as “integrated NOC” on the list. Ibid.
93 The other energy firms on the list that were classified as some form of “NOC” were traded in at
least one stock exchange, such as Russia’s Rosneft (in Moscow and London stock exchanges and
ranked 14th), Colombia’s Ecopetrol (in Bogota, New York, and Frankfurt stock exchanges and ranked
15th), and Norway’s Statoil (in Oslo and New York exchanges and ranked 16th) in addition to the
subsidiaries of the “three barrels.”
94 CPC Corporation Annual Report 2014, 39. In the 2013 annual report, the company only said the
accounting was maintained “generally in accordance with the accounting laws and regulations
governing state-owned enterprises [of the ROC].” CPC Corporation Annual Report 2013, 43.
Interestingly, while this English annual report said if there were any discrepancies of the financial
statements between the English and the Chinese versions, the latter “shall prevail.” No financial
statements whatsoever, however, are found in the Chinese annual reports at least between 2009 and
2013.
95 CPC’s huge loss and FPC’s very small profit in 2012 apparently was due to the artificially low oil
product price that year created by the government price stabilization effort that year. The calculation
was done with figures in their annual reports in NT dollars. See CPC Corporation Annual Report
2014, 36 and 56; Formosa Petrochemical Corporation and Subsidiaries Consolidated Financial
Statements For the period from January 1, 2013 to December 31, 2013 and For the Period from
in the Taiwanese economy by 2013. Table 5.4 below provides important measures of state-owned enterprises’ (SOEs) contribution to Taiwan’s economy over the decades.⁹⁶

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% share of GDP</td>
<td>5.0</td>
<td>8.2</td>
<td>9.4</td>
<td>12.1</td>
<td>10.3</td>
<td>9.4</td>
<td>7.6</td>
</tr>
<tr>
<td>% share of domestic capital formation</td>
<td>24.2</td>
<td>16.2</td>
<td>20.4</td>
<td>30.1</td>
<td>21.5</td>
<td>12.1</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Table 5.4 SOE Contribution to Taiwan’s Economy 1951-2005

The impact of state generated capital to the overall economy has been waning, but probably not to the extent the table above seems to suggest.⁹⁷ After all, private capital in general was supposed to receive great institutional support in the last decade as confirmed by the high economic freedom and competitiveness scores Taiwan received in the years leading to 2013. SOE

Returning to the four-scenario framework to analyse the actor-specific source of Taiwan’s international-domestic-state capital strength, around 2013 domestic private capital is stronger than international capital in the domestic market, especially in the petroleum sector, but still weaker than integrated IOCs in absolute terms. In any event, the lack of indigenous hydrocarbon resources and the intermittent state intervention in oil product pricing during the period studied, as well as a complex web of near-term and deep-rooted economic, political, and historical factors have mostly taken international capital out of picture, except as joint venture partners of state capital in offshore and overseas E&P.

Domestic private capital, in the form of the large oil refining and marketing firm FPC, is financially stronger or at parity with state capital. This would put Taiwan somewhere between scenario two of state “capture” and scenario three wherein state orientation counts the most. Both of these situations seemed to have played out at different times in different aspects of Taiwan’s petroleum sectors in the two decades or so preceding 2013. Overall, private capital was strong in the oil refining and downstream sectors, but much less so in

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⁹⁶ This table was simplified from the more detailed Table 1 on page 326 of Pao et al, “The road to liberalization: Policy design and implementation of Taiwan's privatization.”

⁹⁷ One problem is the shifting definition of what is considered an SOE. By the count of the National Development Council, there are still seven wholly-owned SOEs or literally public-run enterprises [公營事業]. A performance report of SOEs or literally state-run enterprises 國營事業 produced by the Executive Yuan [Branch] in 2015, however, examined 17 SOEs, including all seven on the National Development Council website, as well as ones not on there, such as the Export-Import Bank of ROC and the Taoyuan Airport Corporation. In addition, there is a maze of hundreds of state partially but directly owned [直接投資] and “joint venture” [轉投資事業] companies which definitions are even murkier. For the Executive Yuan SOE performance report of 2015 [國營事業104年度工作考成總報告], accessed 10 January 2017, [http://www.ndc.gov.tw/cp.aspx?n=E075FB75221AFC3A](http://www.ndc.gov.tw/cp.aspx?n=E075FB75221AFC3A).

the upstream sector. Given the generally strong institutional and legal support private capital have had in the decade before 2013, it is not unreasonable to label domestic private capital as having a high strength versus state capital, especially in the petroleum sector. This explanatory variable, therefore, remains consistent with the stipulation of H3 upon closer scrutiny.

5. Taiwan’s Trust in Oil Markets

This section explores in more depth Taiwanese decision-makers’ overall level of trust in the oil markets’ capability to ensure oil supply security to Taiwan’s economy. This level was found to be high in the preliminary study, which is one of the conditions incongruent with the level stipulated by H3. This causal pathway to the adoption of a high level of strategic oil supply measures, as originally formulated, calls for a medium level of trust.

Initially, the same components of securitising agent and domestic and external securitising contexts are examined with content analyses using almost exactly the same terms as in the comparative studies in Chapter Four. The sub-sections below, each corresponding to one component proposed to make up states’ overall trust level in relying on the oil markets for their economies’ oil supply, show that Taiwan’s overall trust level only comes to a medium, not high.

5.1 Taiwan’s Securitising Agents

The “traditional” and vertically integrated NOC of CPC earned a low trust score for Taiwan in the preliminary study as it is hypothesised to act as a powerful securitising or lobbying agent against solely relying on the market for oil supply. The 2010 to 2014 Chinese annual reports of CPC, which provide information of the company from 2009 to 2013, are analysed to understand the extent of its securitising.

CPC engaged in moderate securitising during the five years studied by this measure alone. It has an overall five-year average score of 22.8, higher than Chinese NOCs’ two-year average Chinese annual reports of 14, but considerably lower than India’s five-year average of 37.2 and Thailand’s 34.8. This is unsurprising considering that CPC had both operational as well as sector administration functions. While the company acted as a vehicle of implementing the state’s oil supply policies, its executives would have direct inputs into the formulation of the policies, even if they were not the final decision-makers.

98 The Chinese terms used are adjusted slightly to reflect the common language usage in Taiwan (versus that in Mainland China), but the substantive meanings of them are the same.
99 See Table 16, Appendix D for the breakdown of scores of all four economies.
100 The decision-makers would be officials at the Bureau of Energy at the MoEA, higher officials at the Executive Yuan, and ultimately, elected members of the Legislative Yuan.
This would reduce the need to engage in securitising via annual reports, at least towards decision-makers if not the public.

In addition, the privatisation of CPC and oil sector liberalisation had been declared the ultimate goals by the state at least since 2001. The company is supposed to function as efficiently as possible in preparation for the public offering of its shares. As sector administrator, the company at least had to pay lip service to these goals. This may explain the only pertinent usages of the term “strategic” in the CPC annual reports analysed were describing CPC’s continuous overseas E&P effort as part of its “strategic arrangements.”

Instead, since encouraging “self-developed” hydrocarbon resources by Taiwanese firms has been the official policy, (regardless if they are state- or privately owned), CPC’s efforts or achievements in this area were emphasised in the annual reports. Emphasis on having “self-developed” or “self-owned” oil appears to be a manifestation of a lack of trust in the functioning of the market. It is because, as discussed in Chapter Two, many economists believe it does not really matter which firms or countries develop the resources as they would all go in the big supply pool or “bathtub” that is the international oil market. The sector administrator role of CPC, however, makes it difficult to tease out whether the application of these terms in its annual reports is a reflection of its attempt at or a result of its securitising. In reality, it is likely to be both and the two would continue to “chase” each other in a circle until some exogenous factor breaks it up.

Since the labour union of CPC has been a major stumbling block for CPC’s privatisation, it is reasonable to investigate if the union has acted as an agent securitising oil supply to strengthen their argument against CPC’s privatisation. A random sampling of the publication of the union, Oil Workers [石油勞工], between 2002 and 2013 online shows numerous articles in each issue on the various pitfalls of privatisation of SOEs. Only one article was found to specifically put forward the detrimental effects of privatisation on the economy’s oil supply security. This piece appearing in the publication’s first issue predicted Taiwan’s economic collapse due to volatile oil prices that would change according to

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101 The 2001 “Privatization Plan” proposes to look for strategic investors or to publicly offer shares of the company to accomplish CPC’s privatization. See “Achievements of Privatization,” National Development Council website.
102 The same reference was made once in each of the five annual reports analysed.
103 The terms “self-developed” [自主] or “self-owned” [自有] are searched and analysed in addition to “self-sufficiency” or “self-reliance” analysed in economies in the comparative studies since these terms are used in other Taiwan government documents and that it had almost no indigenous oil resources in the period studied. While the latter terms were not used at all in the annual reports, the first two terms score the highest among all the terms analysed.
105 Although it is the labour union of CPC, it has a deceivingly inclusive name of “Taiwan Petroleum Union” [臺灣石油工會].
fluctuations in the international oil markets.\footnote{Lin Ching-lang, “Our Country’s Energy Policy,” \textit{Oil Workers} Vol. 344 (March 2002) \[林清朗，我國的能源政策，石油勞工\]. Accessed 22 January 2017, \url{http://tpwu.org.tw/oil-workers/193-article-344/8430-29.html}.} If foreign corporation(s) control CPC after the public offering of its shares, FPC could hardly match these corporations’ prowess and would soon be squeezed out of the market. This in turn would lead to mass unemployment and the domestic oil market will be controlled by outsiders, possibly even foreign governments that back the foreign corporations.\footnote{Ibid.}

These scare tactics of the union may be too crude to securitise decision-makers, but their impact on the workaday voters in Taiwan is more difficult to gauge. Under Taiwan’s democratised political system in the last decade, decision-makers have to take voter opinions seriously. The repeated reference to foreign corporations and their possible government backers may also hit a nerve of the diplomatically isolated and strategically vulnerable Taiwanese people.

The results of the content analysis presented in this sub-section show that both CPC and its labour union did act as securitising agents of Taiwan’s oil supply, if not as coherently or powerfully as they could have been. The sector administrator role of CPC would have provided it more direct channels of securitisation, while its executives may also be walking a tight rope in balancing its securitisation effort with its attractiveness to investors when its overdue privatisation finally happens. These two most obvious oil supply securitising agents of Taiwan did not lead to a low trust in the oil markets, judging by their public effort investigated here. Taiwan, therefore, earns more a middle rather than a low score for this component making up its overall trust level.

5.2 Taiwan’s Domestic Context of Trust

According to the vulnerability-interaction model, Taiwan should have a high level of trust in private enterprises supplying oil in the domestic market without any artificial price intervention. Taiwan’s per capita GPD in 2013 suggests that its population as a whole was sufficiently well-off that fluctuations in oil product prices in a free market should not be detrimental to its basic livelihood.\footnote{Ibid.} Taiwan’s populace was also relatively urbanised, although not as highly as Singapore, Japan, South Korea or some other economies in the 109 It had the second highest per-capita GDP among the nine case-study economies in 2013, after Singapore. See Table 3.8 in Chapter Three. It ranked the 30th worldwide and the fourth among Asia-Pacific economies according to the U.S. Central Intelligence Agency (CIA). The three in the region ahead of Taiwan are all city-size economies: Macau, Singapore, and Hong Kong. See “Country Comparison: GDP Per Capita (PPP),” CIA website, accessed 22 January 2017, \url{https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html}.}
The reasoning of the vulnerability-interaction model is that the more geographically concentrated the population is, the fewer people would be left underserved by private oil companies not wanting to extend their supply routes too far due to profit consideration.

As in the comparative studies developed in the Chapter Three, the GINI index reading of Taiwan is examined to give a more detailed picture of the evenness of its economic development. Taiwan’s GINI Index score was 33.6 in 2014, which is lower than China, India, or Thailand’s scores. This means Taiwan’s domestic income was more equally distributed than these economies. Against such a domestic context, it is argued that it would be more difficult for CPC or other securitising agents to convincingly lobby for CPC’s importance in ensuring the basic oil needs of poor and rural residents.

In reality, while formally “liberalising” the domestic oil market, the Taiwanese government also set up a petroleum fund to provide subsidies to cover the difference in transportation costs and wages for operators which supply oil products to indigenous mountainous areas and outlying islands with the Petroleum Administration Act in 2001. Since then, nine amendments to the details of subsidies were promulgated up to 2013. The August 2010 amendment expanded to make residents living in these places eligible for subsidies to be supplied with liquefied petroleum gas (LPG) cylinders. In early 2011, the MoEA also added fishing boat operators, farmers, rehabilitation and public transportation buses, taxi cabs on the list of eligible subsidy recipients.

These subsidies theoretically should take care of the basic oil needs of vulnerable and underserved residents without interfering in oil product pricing or even having an NOC. All operators may apply for the subsidies as long as they engage in oil supply to the relevant

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110 See Table 3.8 in Chapter Three. According to the World Bank data, Taiwan’s 70 urbanization rate in 2013 was also lower than Malaysia’s 73 and Brunei’s 76 in the region even if Australia and New Zealand or other city-size economies are not counted.
112 The scores of China, India, Thailand on the same list are 46.9, 33.6 (same as Taiwan), and 48.4 respectively. Note that India’s reading from the World Bank is slightly higher than Taiwan. See footnote 77 in Chapter Three.
114 Ibid.
areas or sectors. As of the end of 2011, 26,469 households applied for the LPG cylinder subsidies, but no operator applied for subsidies to set up new oil supply facilities (such as gas station) in indigenous mountainous areas. Only one operator applied for subsidy to expand facilities in these areas, and the highest number of applications was to cover wage difference, but even that only involved 12 gas stations.

The less than enthusiastic response to this market-conforming measure may mean that the subsidies do not actually cover the additional costs of supplying oil to these areas or sectors. In reality, there have been only two suppliers at the wholesale level, which is not conducive to competitive pricing. In the meantime, the government still felt the need from time to time to adopt the market-displacing measure of “stabilising” oil product prices across the board by having the CPC selling gasoline and diesel below costs. This appears to indicate a very risk-averse attitude in the part of the Taiwanese government. Has the CPC been specifically securitising its role in the domestic oil market to contribute to this risk aversion?

The CPC did mention in each of its five annual reports analysed that it was “intent on making people’s life more convenient and prosperous,” and it “satisfies the oil product needs of civilians and the military in remote areas without regard to the losses incurred.” Other than that, however, it did not seem to go too far beyond the “usual” corporate social responsibility speech of “helping underprivileged groups and participating in community benefit activities,” or “while pursuing profits, still attending to other issues such as social justice, underprivileged groups, safety and health, community development, and environmental protection.” Even this “cosmetic” lobbying, of course, is considerably more than what Chinese NOCs said in their annual reports of the same period.

If CPC did not trump up the role it played in oil domestic distribution too robustly, there must be other factors that contributed to the Taiwanese government’s disproportional aversion to oil price fluctuations and affordability. This is especially true considering the relatively high objective economic and developmental level Taiwan has achieved in the last two decades. The CPC labour union did trumpet the role played by CPC boisterously, but

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117 The Bureau of Energy of “Petroleum Fund Reward and Subsidies” website above listed 42 rural counties or townships and six outlying islands.
119 Ibid.
120 Different formulae of how to calculate different types of subsidies are listed in the Bureau of Energy website cited earlier.
121 CPC Corporation 2014 Annual Report, 5.
122 CPC Corporation 2013 Annual Report, 7.
123 CPC Corporation 2012 Annual Report, 5.
124 FPC’s 2014 Chinese annual report contains a similar level of this type of CSR speech, such as helping underprivileged groups, but FPC did not mention oil supply to remote areas or things like social justice.
not too frequently. Two established think tanks in Taiwan appear to consistently “defend” the role played by the CPC, if not direct state intervention in oil pricing. One of the proposals the Taiwan Institute of Economic Research (TIER) put forward to improve the floating oil price formulation in 2013, upon the request of the MoEA, emphasised CPC’s social responsibility for stabilising domestic fuel prices.125

In a report titled “Key Report on Floating Oil Price Mechanism,” the CTCI Foundation detailed the evolution of Taiwan’s oil pricing system and the controversies of its implementation in the last two decades.126 The report was a thinly-veiled endorsement of how CPC handled the whole situation under difficult circumstances. It suffered losses in executing the government’s oil stabilisation program when the international oil price was high and was being unfairly accused of not lowering oil prices enough when international oil price was coming down.127

The TIER and the CTCI both have deep and entangling connections with the KMT and hence the CPC. The TIER was founded by the prominent Taiwanese entrepreneur-diplomat Koo Chen-fu [辜振甫] in 1976 as Taiwan’s “first private independent think tank.”128 CTCI was originally set up in 1959 as China Technical Consultants, Inc.129 In 1979, CTCI was split into a for-profit engineering service company, which has provided many services to CPC, and a non-profit foundation in the areas of energy and environmental

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125 The Chinese name of this think tank is 台灣經濟研究院 or more commonly simply known as 台經院. In English reporting, its English name sometimes is confused with another established, but very different think tank, the Taiwan Research Institute, which Chinese name is 臺灣綜合研究院 or simply 臺綜院. The following is an example of such mistaken reporting. The English and the Chinese names given in the piece do not match. According to numerous Chinese media reports on the same event, it was in fact the Taiwan Institute of Economic Research, NOT the Taiwan Research Institute that made a proposal that emphasised CPC’s social responsibility in stabilising oil price. See “Institute proposes amendment to CPC floating oil price model,” The China Post, 29 March 2013. Accessed 20 January 2017, [http://www.chinapost.com.tw/taiwan-business/2013/03/29/374515/Institute-proposes.htm](http://www.chinapost.com.tw/taiwan-business/2013/03/29/374515/Institute-proposes.htm).

126 [浮動油價機制的關鍵報告 2016-1]. In fact, although no individual author is listed on the report’s cover, the inside cover page said the report was mainly written by retired CPC General Manager Lin Mao-wen. The names of three editors were also listed.127 Ibid.

127 Ibid.


policy. Yet, these two “pro-CPC” think tanks did not defend state intervention in oil prices without reservation. The second proposal TIER submitted to the MoEA called for increasing the range of oil price changes by CPC from 80 percent to 100 percent of actual fluctuations in international oil prices. In its concluding remarks, the CTCI report says Taiwan should learn from economies such as United States, Japan, South Korea, Singapore, Hong Kong, and the Philippines wherein oil product prices are freely determined by various oil companies.

At the end of the day, it appears to be populist pressure in a newly democratised political entity that was the major cause of bouts of direct state intervention in oil product pricing in Taiwan up to 2013. CPC began adopting the floating oil mechanism in January 2007, three months after the MoEA announcement of the pilot scheme. Due to rising prices in the international markets, the Executive Yuan (Council), under the leadership of the Democratic Progressive Party (DPP) at the time, decreed to lower maximum price increase from 15 percent to 12 percent in November of that year. This was a critical time in the democratic development of Taiwan as the Legislative Yuan election was coming up in January 2008 and the fourth openly contested presidential election in the history of Taiwan would take place in March. The incumbent DPP president was not doing well and suppressing domestic oil price hike would be an easy “electorate pleaser.”

With mounting losses due to continuously rising international prices, CPC requested to increase the domestic oil prices on 1 January 2008, but the Executive Yuan deferred the decision-making to after the elections. Even after the DPP lost both elections by the end of March, the Executive Yuan refused to “make such a major decision as it had become a caretaker cabinet.” The oil price freeze was finally lifted by the new Premier of the Executive Yuan on 27 May after KMT assumed the presidency.

Between May 2008 and December 2010, gasoline and diesel prices were mostly free-floating, with very brief interference such as a couple of weeks of smaller diesel price

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132 “Key Report on Floating Oil Price Mechanism,” 129.

133 “Key Report on Floating Oil Price Mechanism,” 15.


hike in the aftermath of typhoon attacks or price freeze during lunar new-year holidays.\textsuperscript{136} Then before campaigning began for the first concurrent legislative and presidential elections in January 2012, the CPC adopted the policy of only raising domestic oil prices half that of international price hike to “coordinate with the oil and gas price freeze resolution” in the Legislative Yuan, controlled by KMT at the time.\textsuperscript{137} Ostensibly by November 2010, CPC had accumulated a surplus that was over the “statutory limit.”\textsuperscript{138} Almost like clockwork, however, the government allowed gasoline and diesel prices to resume hiking more in tandem with international prices in April 2012, soon after the KMT-majority legislature and the KMT president were reelected.\textsuperscript{139}

The formula used to calculate the prices in the “floating” oil pricing mechanism generated many negative commentaries and public sentiments and so was repeatedly adjusted.\textsuperscript{140} That led the MoEA to ask two different think tanks, TIER and Taiwan Research Institute as mentioned earlier, to study and make recommendations to the whole oil price pricing mechanism in early 2013. At a symposium related to these studies held in April 2013, a number of independent scholars voiced the opinion that unless the CPC is totally privatised and more competition entered the domestic market, whatever pricing formula the MoEA derived would be criticised and not be accepted by all the people.\textsuperscript{141}

More surprisingly due to the politicised status of CPC and oil pricing policies, and hence probably more convincingly, a legislator from the opposition DPP made the following diagnosis at the symposium. “Taiwan [people] has a very low tolerance in high oil prices…in the previous few years, CPC and Taipower [state-owned power company] were profitable and their prices did not float either, but the people did not complain at the time because they had comfortable lives at the time.”\textsuperscript{142}

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{136}] “Key Report on Floating Oil Price Mechanism,” 16.
\item[\textsuperscript{138}] “Key Report on Floating Oil Price Mechanism,” 16. No mentioning of any “statutory limit” on CPC’s surplus is found in the Petroleum Administrative Act, but it is possible that it is stipulated in other administrative documents governing CPC operation.
\item[\textsuperscript{139}] Ibid. Also see deLisle and \textit{CPC Corporation 2012 Annual Report}, 4. As detailed in footnote 18, the actual policy is rather complicated, which is called “rationalisation,” which tried to let CPC recuperate losses incurred in the previous few months. It was met with such strong public condemnation that it was suspended very soon and was only resumed in October 2013.
\item[\textsuperscript{140}] A major point of contention was that CPC was allowed to reduce oil prices by 50\% of international price fall to recuperate the losses it incurred previously. See footnote 18 for more details for both the price “stabilisation” and the subsequent “rationalisation” policies.
\item[\textsuperscript{142}] Ibid. The legislator is Huang Wei-che [黃偉哲]. See his biography at the Legislature website, accessed 24 January 2017, \url{http://www.ly.gov.tw/03_leg/0301_main/legIntro.action?lgno=00076&stage=9}.
\end{itemize}
\end{footnotesize}
This low tolerance to high oil prices was made more problematic “against the backdrop of bitter partisan battles, ideological polarisation and shaky governance” while Taiwan was still undergoing the transition to a mature democracy. Its electorate was “highly engaged, with a ‘vibrant election culture’ manifest in high levels of citizen interest, knowledge and participation” compared to those in consolidated democracies. Taiwan’s equally vibrant media also helped fan the flames of populist demands on low oil prices. Two decades after the lifting of martial law in 1987, the Taiwanese media was described as transforming from a “lapdog to mad dog.”

At the same time, while still more equal than some other Asian economies as shown earlier, “economic inequalities increased markedly” in the period between 2008 and 2011 when the KMT government allowed oil prices to run free. During the 2012 presidential campaign, the DPP exploited quality of life issues such as income disparity and unemployment. There is little wonder that the incumbent KMT government (both the legislative and the executive branches) adopted the defensive tactic of temporarily freezing oil prices during the campaign season.

Some may understand the Taiwanese government’s interference in oil pricing in the years leading to 2013 as a rational political move which had nothing to do with trust in the domestic oil market’s capability to reliably supply affordable oil to the economy. Yet, the concern that high oil prices would have a sufficiently negative impact on the lives of the electorate to sway election results is a manifestation of decision-makers’ risk preference being lowered probably from “risk neutral” to “risk averse.” As discussed in Chapter Two, this study adopts a behavioural definition of trust which involves both the belief of the trustworthiness of the object of trust and the willingness to accept the risks of performing the trusting act. Taiwan decision-makers apparently did not trust the free market enough (or was risk averse) to perform the trusting act of letting domestic oil product prices float in a

This low tolerance might be “nurtured” by the fact that Taiwan had had the lowest oil product prices among a number of neighbouring economies, such as Japan, South Korea, and Hong Kong. See “Key Report on Floating Oil Price Mechanism,”19 and 29.

143 Jonathan Sullivan, “Taiwan’s 2012 Presidential Election,” Political Studies Review Vol. 11 (2013), 66. Although the wave of populism that has swept through the so-called “consolidated democracies” in Europe and the United States since 2013 shows that the distinction is debatable.

144 Ibid.
147 Ibid., 69.
totally unfettered at all times in the years leading to 2013, regardless of the degree of the decision being rational calculation.

The declared objectives of privatising CPC and liberalising oil pricing by decision-makers of both major political parties suggest that most of them believed that a domestic oil market with minimal state intervention was ultimately correct policy direction. The same decision-makers, however, seemed to be unwilling to accept the risks of trusting the domestic market to supply affordable enough oil to the people in the high oil price years leading to 2013, especially during the critical election season. The existing duopolistic domestic oil market and the low tolerance of high oil prices by the people in Taiwan, therefore, more than Taiwan’s highly developed economy, served as the pertinent domestic context. This situation lowered the state’s willingness to accept the risk of fluctuating availability and prices that would come with the open market system. Indeed, the concern of stable supply of oil products and natural gas in the domestic market after CPC privatisation was raised in the National Development Council report on the SOE privatisation, which appears to be bipartisan. The most pertinent domestic context to Taiwan’s decision-makers, therefore, at best led to a medium trust in a totally free domestic oil market circa 2013.

5.3 Taiwan’s External Securitising Context

In this category, Taiwan receives a high score for its relationship with the United States in the preliminary study. The vulnerability-interaction model hypothesises that such an external context can hardly be exploited to securitise the untrustworthiness of the international oil markets. The United States had the capability to underwrite the stability of the system upon these markets have rested, especially the freedom of navigation in international waters along major maritime oil shipping routes to the Asia-Pacific. Up to 2013, it also appeared to have the willingness to take actions when the need arose, such as when Iran threatened to close the Strait of Hormuz in 2012. Being an ally of the United

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148 The observation of this being a bipartisan concern is based on the fact that the report was supposed to be last updated on 31 December 2016, almost a year into the DPP administration. The National Development Council is a “major policy planning organization” under the Executive Branch. See “Vision, Mission, and Policy Direction” National Development Council website [願景、使命與施政方向, 國家發展委員會]. Accessed 5 February 2017, http://www.ndc.gov.tw/cp.aspx?n=7F220D7E656BE749&s=5C3F3ED6E0AA4055.

States, a polity would expect that the powerful American capability is unlikely be used against its own core interests while it enjoys the public goods of unimpeded shipping and transactions associated with oil and other types of international trade.

The high trichotomous score is generally given to a formal and, in the case of Taiwan, de facto U.S. ally in the preliminary study. This section investigates the extent Taiwan’s relationship with the United States in the decade leading to 2013 would make securitising solely relying on private firms and the international oil markets for Taiwan’s oil supply largely irrelevant. It also examines if there were other pertinent external factors that could easily be exploited by interested parties to securitise the role the Taiwanese government could or should play in the oil supply to the economy.

Taiwan has not been a formal ally of the United States since 1979 and the U.S. commitment of protection against coercion and arms sales to the island has been conditioned and ambiguous.\(^{150}\) The commitment has been contingent on “no unilateral statements or actions” that change the status quo of Taiwan by either Taiwan or China.\(^{151}\) This ambiguity not only stems from what constitutes “status quo” as defined by the United States,\(^ {152}\) but also what actions exactly it would perform. The U.S. Assistant Secretary of Defense Joseph Nye reportedly responded to Chinese queries on hypothetical attack on the island during the 1995-1996 Taiwan Strait Crisis by observing that, “we don’t know what we would do, because it’s going to depend on the circumstances, and you don’t know what we would do.”\(^ {153}\)

One would expect this strategic ambiguity pursued by the United States and the increasing economic and military capabilities of China over the last two few decades to heighten Taiwan’s threat perceptions. If that was the case, it would be an external context that facilitates interested parties’ efforts to securitise oil supply to Taiwan since oil has traditionally been portrayed as a strategic resource, critically needed during wartime. Besides, most of the oil supply to Taiwan had to be shipped past the coast of Southern China before reaching Taiwan. In the event of a Chinese blockade of the Taiwan Strait, oil supply to the island would be interrupted, if not completely severed.


\(^{152}\) One of the “core principles” of the U.S. policy towards Taiwan listed in the testimony above reads, “…unilateral moves that would change the status quo as we define it.” Ibid.

\(^{153}\) Kastner, “Ambiguity, Economic Interdependence, and the U.S. Strategic Dilemma in the Taiwan Strait,” 652.
In reality, Taiwan’s threat perceptions, while somewhat fluctuating, generally trended downward in the last two decades. According to polls by various organizations over recent years, most Taiwanese were mindful of the military might of China and lacked confidence in their own defence capability at the same time. Yet, the majority of those polled did not think China would launch attacks against the island in the near future, especially if Taiwan does not declare independence from China. The softening of China’s posture towards Taiwan after the U.S. and Taiwanese politico-strategic blowback resulting from its belligerence during the 1995-1996 Taiwan Strait Crisis and an improved understanding on the part of Taiwanese leaders of “China’s red-lines” relative to limiting Taiwan’s prerogative to declare its independence may partially explain this apparent paradox.

The real reason of the lowering threat perceptions, however, seems to lie in the Taiwanese public’s increasing confidence that the United States would come to Taiwan’s rescue against unprovoked Chinese attacks, or even if Taiwan were to declare its independence. Forty-seven point five percent of survey respondents in 2003 and 56.4% in 2011 said “yes” to this hypothetical question on a Taiwanese declaration of independence. This confidence shot up to 73.5 percent in 2011 “if the attack is unprovoked,” meaning Taiwan maintaining the status quo. Regardless whether or not this confidence was misplaced, it appears that the United States sending two aircraft carrier groups to the Taiwan Strait during the 1995-96 crisis was the turning point in Taiwanese public perceptions.

Independent observers have not reached a consensus over whether Taiwan’s political elites and decision-makers shared this lowered threat perception with the general

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This does not mean that Taiwan’s threat perceptions were actually low as those perceptions started from a very high level during the martial law period. Ronan Tse-min Fu classified it as “modest” in his study.


156 Ibid., 20.

157 Especially after Hu Jintao assumed the leadership of the Chinese Communist Party in 2002 and adopted a more patient and conciliatory approach towards Taiwan. See Ding and Huang, “Taiwan’s Paradoxical Perceptions of the Chinese Military,” 45-46; 50.


159 Ibid.

Taiwanese public opinion is “malleable and constantly shifting.”\footnote{fu cited Taiwanese defence officials saying it was highly unlikely that China would attack Taiwan. “Threat Perception, Power Asymmetry, and Alliance: Explaining Taiwan’s Declining Military Expenditures,” 20-21. Yuan-kang Wang and Ding and Huang seem more sceptical. See “Taiwan Public Opinion on Cross-Strait Security Issues – Implications for US Foreign Policy,” 108; and “Taiwan’s Paradoxical Perceptions of the Chinese Military,” 50-51.} Taiwanese leaders, moreover, understood that as long as China did not renounce the use of force as an option to eventually “reunite” with Taiwan, the threat to Taiwan’s long-term security remained. Arthur S. Ding and Paul A. Huang describe this situation as “a major contrast between long-term threat and short-term stability in cross-Strait relations.”\footnote{Yuan-kang Wang, “Taiwan Public Opinion on Cross-Strait Security Issues – Implications for US Foreign Policy,” 108}

This long-term strategic threat always loomed at least in the background. The thawing of U.S.-China relationship in the early 1970s, eventually leading to the “status quo” of Taiwan seriously restricted Taiwan’s international manoeuvring space. China continued (and still continues beyond 2013) to block or manipulate Taiwan’s participation in international meetings or organizations, apparently in accordance with the level of “obeisance” by Taiwanese leaders. The saga of China blocking Taiwan’s participation in the World Health Organization (WHO) activities during the pro-independence DPP presidency years (2000 – 2008) and “letting” Taiwan attending the annual World Health Assembly of the WHO in 2009, after the KMT president was elected was a recent prominent example of Beijing’s carrot-or-stick strategy directed towards Taipei.\footnote{An internal WHO memo was leaked to the press in 2011 which shows the WHO had “arrangement with China” that governs the procedures WHO was to interact with Taiwan. See Bonnie S. Glaser, \textit{Taiwan’s Quest for Greater Participation in the International Community} (New York: Rowman & Littlefield, 2013), 17. Also see Czeslaw Tubilewicz, “Friends, Enemies or Frenemies? China-Taiwan Discord in the World Health Organization and Its Significance,” \textit{Pacific Affairs} 85-4 (December 2012): 701-722.}

The only international energy organization Taiwan was able to participate in was the APEC Energy Working Group, comprising of 21 Asian Pacific economies, including China and the United States, as long as it was being referred to as “Chinese Taipei” and an “economy” rather than a country.\footnote{International Energy – International Forums Contribute to Energy Cooperation within Constraints (Washington D.C.: United States Government Accountability Office, December 2006), 10-11.} China used such nomenclatures to rein in Taiwan’s independence aspirations, as well as to pressure other states not to have any dealings with a Taiwanese “state” on a pro forma basis even in domains not traditionally associated with high politics, such as health care and energy cooperation. The United States, eager to maintain its posture of strategic ambiguity in the Taiwan Strait, often complied with the rules of this Chinese-induced naming game.\footnote{The U.S. Department of Energy, for example, in its comments on the draft of the report in footnote 165 suggests the energy consumption amounts of “countries” featured in a graph in the report be}
Apart from constricting Taiwan’s manoeuvring space in the international arena, China has also become a major player in Taiwan’s economic well-being in the last two decades. By 2002, China had replaced the United States as Taiwan’s number one export market, and absorbed between 21 (excluding Hong Kong) and 40 percent of Taiwan’s export in 2012. Taiwan’s petrochemical industry, with surplus capacity for the domestic market resulting from transformation of the island’s economy from one dominated by labour intensive light industries to technology products, exported 55% of its products to China.

China also became the top destination of Taiwan’s outbound FDI and production base for many of Taiwan’s information technology product exports, including the infamous Foxconn factory for Apple products. Taiwan restricted Chinese investments on the island due to security concerns, which have only been gradually eased since 2009. This partly explains the over 100 times larger amount of Taiwanese investments in China than the other way round during the period studied. In short, as much as the Taiwanese government tried to “strike a balance between growth and security,” the economy inevitably developed an increased so that Taiwan would not make it to the graph, presumably to avoid embarrassment. Ibid., 56-57.

167 Murray Scot Tanner, Chinese Economic Coercion Against Taiwan – A Tricky Weapon to Use (Santa Monica, CA: Rand Corporation, 2007), xiii.


This was up from zero before the 1980s and about 17 percent in 2003. See Tanner Chinese Economic Coercion Against Taiwan – A Tricky Weapon to Use, xiii.


172 Taiwan’s outbound investments in China were also prohibited until 1992, and there were still restrictions on them. See “2013 Investment Climate Statement,” U.S. Department of State website, February 2013 (details in footnote 71). The cumulative approved Chinese investments in Taiwan up to 2014 were a little more than US$1.1 billion. See “Mainland Investments in Taiwan Reduced by 4.25 percent last year,” China Times website, 20 January 2015 [陸資來台投資金額去年減少4.25%，中國時報]. Accessed 2 February 2017, http://www.chinatimes.com/realtimenews/201501200003953-260409.

Official figures of Taiwanese investments in China are usually underestimated, especially when such investments were just permitted in the early 1990s when the restrictions were great. Many Taiwanese entrepreneurs invested through third locations, such as Hong Kong or tax havens in the Caribbean. One estimate puts the cumulative figures up to 2009 as about US$117 billion. See Daniel H. Rosen and Zhi Wang, The Implications of China-Taiwan Economic Liberalization (Washington, D.C.: Peterson Institute for International Economics, 2011), 26-30.
“asymmetric interdependence” with the Chinese economy, with Taiwan being the more vulnerable partner.\textsuperscript{173}

Admittedly, as Murray Scot Tanner points out, Chinese economic coercion against Taiwan would be a “tricky weapon to use.”\textsuperscript{174} Such a weapon would also hurt China’s economy, although proportionally to a smaller degree. More importantly, it would not be easy for China to translate “economic influence into political leverage,” especially on the “sovereignty issues.”\textsuperscript{175} The Taiwanese public’s confidence in U.S. commitment to defend the island would make any such translation even harder. In a democratised Taiwan with a rambunctious media, decision-makers became very sensitive to public opinions, whatever their own judgement on the situation may be. Beijing’s frustration with the effectiveness of this “softer” approach, however, would only make cross-Strait relations more volatile.\textsuperscript{176}

So how does Taiwan’s external context of living with U.S. strategic ambiguity and under the shadow or Damocles’ sword of Chinese economic, military and diplomatic might relate to securitising Taiwan’s quest for oil supply security? While Taiwan’s relatively positive relationship with the United States would make securitising about the instability of the international oil markets difficult, Taiwan’s overall precarious geopolitical situation seemed to colour every aspect of its policymaking, including oil supply policies.

First, Taiwan would be compelled to have a sizeable oil stockpile so that it would stand a chance to defend itself in a military contingency before help arrived, even with great confidence that the Americans would come to its rescue in case of a China’s military attack. One think-tank report suggested that Taiwan’s military jet fuel daily consumption to defend the island would be four times higher than its civilian consumption.\textsuperscript{177} Calculating Taiwan’s total government and commercial oil stockpile and refining capacities up to 2013, the report estimates that Taiwan was able to meet its “combined military and civilian jet fuel needs in an air war for five months” if Taiwan could protect its oil facilities from being damaged.\textsuperscript{178} This was about three times longer than China could sustain its combined jet fuel needs with its oil facilities up to 2013 estimates.\textsuperscript{179}

Such a scenario can easily be securitised to lobby for the continued existence of an NOC since it can be argued that the military can requisition and reconfigure NOC

\textsuperscript{173} Tanner, \textit{Chinese Economic Coercion Against Taiwan – A Tricky Weapon to Use}, xiii to xiv. Tanner’s monograph Taiwan’s economy also has numerous other major vulnerabilities that China may target, such as its stock markets, bonds, and foreign exchange markets, information networks.

\textsuperscript{174} \textit{Chinese Economic Coercion Against Taiwan – A Tricky Weapon to Use}, 135.

\textsuperscript{175} Ibid., 142.

\textsuperscript{176} Ibid.


\textsuperscript{178} Admittedly, whether Taiwan could successfully protect its oil stockpiling and refining facilities from air attacks by China is a big if. Ibid.

\textsuperscript{179} Ibid.
facilities to produce jet fuel and other needed oil products more swiftly and directly. The same report also surmises that “the potential strain on both countries’ [China and Taiwan] fuel supplies may encourage them to pursue policies that would bolster oil access in a worst-case conflict scenario.” Regardless of the extent Taiwanese decision-makers already had “strategic oil reserves with military contingencies in mind” as the report writer asserts, the importance of CPC’s overseas hydrocarbon E&P efforts can easily be inflated in view of FPC’s much smaller existing upstream business and the diplomatic isolation of Taiwan.

Besides, the waters Taiwan tried to explore offshore hydrocarbon have been disputed by numerous countries in the region. The complexity of the geopolitics involved can easily be securitised as a domain only an NOC is capable of handling. By the time the Taiwanese government set up five offshore petroleum E&P regions in 1970, the United States had already begun its soon-to-be-public diplomatic coup de grace against Taiwan. As a result, Taiwan or the ROC lost its seat in the UN in 1971, then the diplomatic recognition by the United States in 1979. In 1971, the United States also gave Japan the administrative power over the Ryukyu/Liuqiu Islands and Senkaku/Diaoyu Islands, thus altering the legal maritime territorial boundaries among nations. Not counting China’s claims, four of the five original Taiwanese offshore petroleum E&P regions overlapped with claims by Japan or South Korea.

CPC partnered up with at least six U.S. companies, such as Amoco, Gulf, and Conoco Phillips, to explore hydrocarbon potentials in these locales in the early 1970s. By the late 1970s, all of them requested to withdraw from the contracts by exercising the force majeure clause in their contracts. Although the United States officially asserted that it took a neutral position regarding sovereign claims in the region, the changing geopolitical situation initiated by the U.S. actions likely contributed to the premature withdrawal of U.S. oil firms.

In 2011, the Taiwanese government issued a license for CPC to explore hydrocarbons in the first offshore petroleum E&P region, centering on Taiping Island/Itu

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180 Ibid., 13.
181 Ibid.
182 Tseng, “Establishment of our country’s offshore oil E&P regions and cooperation with foreign companies to explore oil,” 11.
184 Ibid., 14.
185 Ibid.
186 Some projects were found to be geologically unpromising. Ibid., 14 – 17.
187 Tseng asserts that the U.S. State Department exerted pressure on these companies of staying clear of projects involving sovereignty claims. 16-18. Also see Niksch, “Senkaku (Diaoyu) Islands: The U.S. Legal Relationship and Obligations.”
Abu, a feature of the much disputed Spratly Group. Since the Taiwanese claims in the East and South China Seas have been similar to those of China, partnering up with the Chinese NOC specialising in offshore hydrocarbon E&P, CNOOC, might eliminate one obstacle to Taiwan’s quest for “self-developed” oil supply from its surrounding waters.

China reportedly invited CPC to participate in the bidding for E&P in the East China Sea in 1993, but Taiwan did not respond, supposedly out of security and political concerns. After some more secret and abortive attempts of cooperation, CNOOC and OPIC finally signed an agreement to jointly explore the hydrocarbon potentials in the Tainan Basin in 1996. In fact, apart from minimising possible liabilities, the whole purpose of setting up and using the shell company OPIC instead of the name China Petroleum Corporation in CPC’s overseas oil E&P was to sidestep thorny political and diplomatic issues discussed earlier. CNOOC and OPIC engaged in a few more joint projects over the years, as listed in Section 2.4.

This sub-section has maintained that Taiwan’s quasi-alliance with the United States in isolation would make securitising about the international oil markets difficult. It was, however, exactly the external context that led to the pursuit of this relationship outside normal diplomatic channels and the ramifications of such a quest that have necessitated the Taiwanese government to juggle volatile and high-stake factors to keep the island diplomatically, politically, and economically viable. I argue that these factors have caused successive Taiwanese governments, even the more pro-independence, pro-liberalisation DPP, to be more risk averse in the pace of NOC privatisation and oil supply policies in general. The Tainan Chaoshan Petroleum Operating Company Limited, the first 50-50 joint venture between OPIC and CNOOC for the E&P in the Tainan Basin.

188 Tseng, “Establishment of our country’s offshore oil E&P regions and cooperation with foreign companies to explore oil,” 19.
190 Although CPC’s drilling around Taiping Island/Itu Aba was not a project that partnered up with CNOOC, the Chinese government seems to be rather tolerant of its actions so far. CPC’s existing cooperative relationship with CNOOC as well as the propaganda and/or political intention may have contributed to China’s unusual reticence. See J.R. Wu, “Beijing untypically quiet on Taiwan drills in South China Sea,” Reuters website, 30 November 2016. Accessed 3 February 2017, http://www.reuters.com/article/us-southchinasea-taiwan-idUSKBN13O0SU.
192 Ibid.
193 Taiwan Petroleum Exploration 2011-2015 - Volume Eight, 189. (Chapter Four – Exploration and Production of Overseas Exploration Blocks), 189 and 193. For more about the establishment of OPIC in 1979, see footnote 31. China Petroleum Corporation was only renamed CPC Corporation in 2007. See footnote 5.
194 Xi Zhigang, “Front and Back Stages of Cross-Strait Petroleum Cooperation.”
Basin and the Chaoshan Trough, for example, was established in 2003, during the DPP presidency.195 Taiwan’s overall external context, therefore, is not conducive to a high level of trust in solely relying on the open markets for its oil supply. While Taiwan’s relatively positive relationship with the United States did offer it some reassurance, the Taiwanese government is risk neutral at best. This would lead to a medium level of trust in relying on the international oil markets alone and hence the great emphasis on “self-developed” oil.

The more in-depth investigation in this section shows that Taiwan scored a medium in each of the components making up the overall trust in the oil markets. Its traditional and vertically-integrated NOC did not securitise its role too strongly, probably because it was also the administrator in a sector decision-makers had set a clear goal of liberalisation. Taiwan’s domestic context of a high level of economic development was not as salient as demands generated by its populist politics. Its external context of having a quasi-alliance with the United States was overshadowed by its precarious geopolitical situation represented by its relationship with China. Taiwan’s overall trust level in the markets’ capability of ensuring reliable and affordable oil supply, therefore, should more accurately be described as “medium.” All these factors at best made the state risk neutral about the long-term savings but probably short-term volatility that may accompany total reliance on open markets.

6. Taiwan’s Implementation Capability

Taiwan only had a medium, not high, overall capability to implement strategic oil supply measures according to the preliminary study, which is another condition incongruent with the pathway to the adoption of a high level of such measures formulated by H3. This section examines in greater details the components making up the overall capability of Taiwan in the period studied to re-assess the accuracy of the preliminary result. The section also investigates if there is any empirical link between these capabilities and the level of strategic oil supply measures adopted.

Taiwan’s overall medium implementation capability is made up of a high financial capability score, a low diplomatic capability score and a medium centralization score. After more in-depth investigation of these three components, this overall capability appears to straddle between a medium and high level by global standards. The key is the relative importance of financial capability and diplomatic capability in the actual implementation of strategic oil supply measures.196 Taiwan has a high financial capability but a medium diplomatic capability by global standards. Further, its diplomatic capability was derived

195 Ibid. Also see Taiwan Petroleum Exploration 2011-2015 - Volume Eight, 189. (Chapter Four – Exploration and Production of Overseas Exploration Blocks), 194.
196 The preliminary study essentially gives these three components equal weights.
mostly from its financial capability and had a tenuous diplomatic basis, due to its awkward diplomatic position in the international arena.

6.1 Taiwanese Financial Capability

The high financial capability of Taiwan in 2013 was made up of its high level of foreign reserves and credit worthiness, and medium GDP. It had the third highest foreign exchange reserves among the nine case-study economies, after China and Japan.197 Even on a global scale, its US$423.9 billion reserves still makes Taiwan among the top five reserve-holding economies.198 Its 2013 credit worthiness shared the same highest score on with China and Japan among the case-study economies.199 In a quick counting with the S&P rating only for about 130 economies globally, Taiwan was still among the top 30, so it justifiably retains its high trichotomous level.200 As to its GDP, Taiwan ranked the fifth among the case-study economies.201 By one account, it ranked 22 out of 230 economies in the world around 2016 on a U.S. dollar purchasing power parity basis.202 Even compared by per capita GDP, Taiwan still ranked 30th among the same economies.203 Its GDP, therefore, would move up to be among those having a high trichotomous level by global standards. Overall, Taiwan indeed had a high financial capability to implement strategic oil supply measures if it so inclined, even by global standards.

In the comparative studies in Chapter Four, NOC profitability is investigated as an additional source of capability. Taiwan’s relatively recent and uneven implementation of oil price liberalisation is reflected in the widely fluctuating profit or loss of CPC in the years preceding 2013. Huge losses were incurred in the years CPC was instructed to “stabilise” domestic gas and diesel prices while the international prices were rising. The result was that it had a modest five-year (2013-2009) average loss and a large six-year average (2013-2008) loss and corresponding negative profit-to-equity ratios. As a comparison, the five-year ratio of both India and Thailand’s NOCs of the same period are over 10 percent. Table 5.5 below illustrates the situation:

197 See Table 3.11 in Chapter Three.
198 According to the World Bank data, Saudi Arabia’s over US$700 billion and Switzerland’s over US$500 billion reserved in 2013 would have pushed Taiwan down two ranks (The World Bank does not present information on Taiwan directly).
199 It was 4.3 by averaging the IMF 24-point scale results from three credit reporting agencies. See Table 3.13 in Chapter Three.
201 After China, Japan, India, and South Korea’s. See Table 3.12 in Chapter Three.
### Table 5.5 CPC Profitability 2013 – 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>net profit/loss (1,000 NTS)</th>
<th>net profit/loss (1,000 US$)</th>
<th>Owner's equity (1,000 NTS)</th>
<th>profit/equity ratio (%)</th>
<th>Oil Pricing Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>3,292,244</td>
<td>$113,500</td>
<td>227,102,848</td>
<td>1.45</td>
<td>MoEA initiates think-tank review of pricing formulae</td>
</tr>
<tr>
<td>2012</td>
<td>-33,728,183</td>
<td>-$1,122,860</td>
<td>222,073,545</td>
<td>-15.19</td>
<td>Floating pricing resumed in April</td>
</tr>
<tr>
<td>2011</td>
<td>-32,449,832</td>
<td>-$1,112,630</td>
<td>273,593,428</td>
<td>-11.86</td>
<td>Halving of international price hike continued</td>
</tr>
<tr>
<td>2010</td>
<td>16,074,346</td>
<td>$503,109</td>
<td>267,989,508</td>
<td>6.00</td>
<td>Halving of int’l price hike began in December</td>
</tr>
<tr>
<td>2009</td>
<td>37,652,597</td>
<td>$1,147,260</td>
<td>253,225,695</td>
<td>14.87</td>
<td>Largely floating</td>
</tr>
<tr>
<td>2008</td>
<td>-120,058,736</td>
<td>-$3,658,150</td>
<td>213,867,151</td>
<td>-56.14</td>
<td>Capping price hike at 12% between Dec 07 to May 08</td>
</tr>
</tbody>
</table>

| five-year average (2013-2009) | -$94,324 | five-year average (2013-2009) | -0.95 |

The situation summarised in the table above suggests that CPC did not have much financial capability to pursue oil E&P projects or other strategic oil supply measures independent of that endowed by the Taiwanese government. As discussed in Section 2.1 above, the Petroleum Administration Act did provide partial E&P subsidies to domestic oil firms, but the Bureau of Energy was still responsible for approving the applications. The maximum subsidy was only 50 percent for exploration projects and 12 percent for development projects. In short, the Taiwanese government had high financial capability to implement strategic oil supply measures, such as the various types of oil supply related subsidies stipulated in the Petroleum Administration Act, including the more market-conforming subsidies provided to operators in remote areas. However, the financial situation of CPC did not add much to this capability. The oil pricing adjustments shown in Table 5.5 suggest that financial capability in the form of profit or loss by CPC did contribute to the

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204 Net profit/loss and owner’s equity figures are extracted from CPC English language annual reports of various years. It is interesting to note that these figures are not available in the Chinese language annual reports.

205 Calculation is made using figures from the left hand column and historical exchange rates of respective years. Historical exchange rates are obtained from “Oanda Currency Converter,” accessed 3 February 2017, [https://www.oanda.com/currency/converter/](https://www.oanda.com/currency/converter/).
level of strategic oil supply measures adopted in the form of how much or how long pricing adjustments could be sustained in addition to political considerations as discussed in Section 5.2 above.

6.2 Taiwanese Diplomatic Capability

Taiwan received the lowest score for diplomatic capability in the plausibility probe of this study because it was not even a UN member. Various types of UN memberships are the only criterion used there to gauge this capability as they have different potentials to generate quid pro quo that may be sought by oil supplying nations. In the comparative studies, the expenditures of government ministries and departments that likely have oil diplomacy functions are examined to expand the evaluation of respective countries’ implementation capability. Similar procedures are followed in the case of Taiwan.

Taiwan’s Ministry of Foreign Affairs (MoFA) deals with political entities, international organizations and activities Taiwan received formal recognition as well as those it does not. Still, MoFA publications hardly mention its goals, activities or expenditures related to oil or even energy, let alone oil diplomacy.\(^{206}\) A few mentioned the development of “green” or renewable energy, such as helping the Solomon Islands develop solar power,\(^{207}\) or promoting green energy products during the APEC meetings in Taiwan.\(^{208}\) The fact that only a couple of the twenty odd countries Taiwan had diplomatic relationships with throughout the period studied were oil producing partially explains the rare appearances of oil diplomacy related terms.\(^{209}\) It was also likely that oil diplomacy related activities have been the domain of OPIC and its many affiliates, and for a long time, also


\(^{208}\) MoFA Units 2012 Annual Final Accounting Reports, 12.

\(^{209}\) In 2000, Taiwan had diplomatic relationships with 29 countries. Among these countries, oil had already been or would soon be discovered in Chad, Costa Rica, and Gambia. Costa Rica would be the only one among the three that were already producing oil before breaking diplomatic relations with Taiwan in 2007. The other two countries were likely only at the exploration stage when they maintained diplomatic relations with Taiwan. For the list of the countries mostly have severed relationships with ROC since 2000, see Czeslaw Tubilewicz and Alain Guilloux, “Does size matter? Foreign aid in Taiwan’s diplomatic strategy, 2000-8,” Australian Journal of International Affairs 65:3 (2011):323.
KMT-owned or sponsored enterprises.\textsuperscript{210} Taiwan’s diplomatic dilemma nurtured the “corporate emissary” function of KMT affiliated companies and even after the separation of the state from the party in the late 1980s.\textsuperscript{211} The KMT most likely still “has not given up its habit of utilising its own stable firms to carry out strategic goals.”\textsuperscript{212}

This caveat notwithstanding, this study does conduct an analysis of Taiwanese MoFA’s expenditures between 2009 and 2013. The ministry’s five year (2013-2009) total expenditure to GDP ratio is 0.16, which is more than double the same ratio of counterpart ministries and other relevant departments for the same period in all the other three economies examined so far.\textsuperscript{213} This ratio drops to 0.09 if the items related to foreign aid, “international care and rescue” [國際關懷與救助] and “international cooperation” [國際合作], are taken out.\textsuperscript{214} That it is still higher than India, Thailand, or China’s official relevant departments to GDP ratio.

If we add this factor to the likelihood that many oil diplomacy functions would be carried out by other entities (as stated earlier), Taiwan’s oil diplomacy capability does not seem so low. Due to Taiwan’s structurally awkward international position, which makes it difficult to offer any substantive diplomatic support freely to oil producing nations or international oil or energy organizations, however, its oil diplomacy capability could not elevate to a trichotonously high level any time soon. A middle level would be more befitting during the period studied.

Taiwan received the medium centralization score as a democracy in the preliminary study since democratic states are hypothesised to be generally less efficient in implementing policies they want in the short and medium term than autocracies, but are more stable and efficient than anocracies. The 2008 elections were the second largely peaceful change of power through free and fair elections in Taiwan.\textsuperscript{215} The existence of a “no-holds-barred” Taiwanese media in this century is another signpost that this polity had

\textsuperscript{210} Ten overseas OPIC affiliates in various countries are listed on one CPC website. See footnote 31.
\textsuperscript{212} Ibid. KMT controlled both the Executive and Legislative Branches between 2008 to 2016.
\textsuperscript{213} India’s ratio was 0.07, Thailand’s 0.06, and China’s was 0.011. See Chapter Four. Taiwan’s ratio does not change even if its expenditures for the item “international care and rescue” [國際關懷與救助] is deducted. Sources of these expenditures are from the MoFA Units Annual Final Accounting Reports. See footnote 204 for details.
\textsuperscript{214} Supposedly, the MoFA used the sizeable “international cooperation” budget as a “confidential budget” for foreign aid in addition to the official aid budget from the Overseas Economic Cooperation and Development Fund. See Tubilewicz and Czeslaw, “Does size matter? Foreign aid in Taiwan’s diplomatic strategy, 2000-8,” 326-329.
\textsuperscript{215} The first time was from KMT to DPP in the 2000-2001 presidential and legislature elections and the second time from DPP to KMT in the 2008 elections.
transitioned from an anocracy to a democracy in the period studied. The sensitivities Taiwanese decision-makers exhibited towards possible negative consequences of oil price hikes during election seasons despite their near consensus of the long-term direction of sector liberalisation illustrates the brake democracy may put on liberalisation. In fact, it reveals an inverse trend: the executive branch can only implement strategic oil supply measures either with the agreement of or be ready to fight with opposition politicians, especially if they control the legislature. Taiwan’s middle centralisation score, therefore, seems appropriate in its impact on the overall capability to implement strategic oil supply measures.

7. Conclusion

The data presented in this chapter show that the pathway that led Taiwan to adopt a high level of strategic oil supply measures around 2013 does not diverge as much from that of H3 as implied in the preliminary study. Yet, the two causal paths still do not completely overlap with the way variables are currently operationalised.

Taiwan’s OV did not reach a high level among major net oil importing economies in the Asia Pacific region. It, however, almost certainly reached a trichotomously high level by global standards due to the exceptionally high OV of the region compared to other regions of the world. The overall strength of Taiwan’s private capital remained high, including in the petroleum sector, but international capital was still relatively weak in the island’s economy. Taiwanese decision-makers’ trust in the oil markets was best described as medium due to their neutral risk tolerance created by securitising contexts most pertinent to these individuals. The Taiwanese government probably still only had an overall medium capability to implement strategic oil supply measures due to its delicate diplomatic position in the international arena. Nonetheless, it had a high financial capability to implement these measures even by global standards and its high financial capability clearly enabled the government to implement a high level of such measures. Table 5.6 below summarises these results and the divergences with the stipulations of H3 and results in the preliminary study.

<table>
<thead>
<tr>
<th></th>
<th>DV Level</th>
<th>OV (IV) Level</th>
<th>Strength of Private Capital</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect Fit (Three-High Cases)</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Taiwan 2013 In-depth results</td>
<td>High</td>
<td>Medium/High</td>
<td>High</td>
<td>Medium</td>
<td>Medium/High</td>
</tr>
<tr>
<td>Taiwan 2013 preliminary results</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 5.6 Taiwan’s 2013 Variable Levels compared to H3 Stipulations

216 Taiwan earned a “democracy” score by the mid-1990s (between six and nine) and a full or consolidated democracy score (10) by the mid-2000s. See “Polity IV Country Report2010: Taiwan.” Accessed 2 February 2016, [http://www.systemicpeace.org/polity/Taiwan2010.pdf](http://www.systemicpeace.org/polity/Taiwan2010.pdf).
The pathways the vulnerability-interaction model hypothesises to lead to the adoption of a high level of strategic oil supply measures are based on two *a priori* conditions: having a high implementation capability and NOT a high level of trust in the markets. Taiwan’s case seems to suggest that the two *a priori* conditions are not equal in importance. Not having a high level of trust in the markets seems to be more important than having an overall high implementation capability in causing the adoption of a high level of strategic oil supply measures, especially in economies that are generally open and free. This study of Taiwan also suggests that financial capability is a more important component to the overall implementation capability than diplomatic capability.\(^{217}\) Taiwan clearly qualifies to have a high financial capability both by regional as well as global standards, but at best a medium diplomatic capability. Most of the strategic oil supply measures the Taiwanese government continued to adopt were sustained by its high financially capability.

If Taiwan’s OV is viewed by global, not regional, standards and that its overall implementation capability may be considered high with financial capability given greater weight, then Taiwan’s conditions as of 2013 would fit the stipulations of H3. These two “ifs” do not stray far from the facts. Instead, the former expands the scope of the study beyond the Asia Pacific to possibly make it more generalisable. The latter appears to be a reasonable refinement to the measurement of the variable. The stipulations of H3, therefore, are not amended at this point and its validity is conditionally confirmed pending further testing with more cases in future research, especially with financial capability being given a greater weight.

The apparent hierarchy among the two *a priori* conditions to the adoption of a high level of strategic oil supply measures relates to the trivialness or relevance of necessary and sufficient conditions in their causal roles in any particular event. In an extreme example, the presence of oxygen is also a necessary condition for decision-makers of a net oil importing economy to adopt strategic oil supply measures. This is obviously an infinitely less relevant necessary condition.\(^{218}\) The second level of the vulnerability-interaction model as it is currently formulated implies two of the four explanatory variables hypothesised by the model, the two *a priori* conditions, have greater importance in causing the adoption of a high level of strategic oil supply measures than the remaining two. It does not, however, differentiate the significance among the two *a priori* conditions. This in-depth study of Taiwan suggests that NOT having a high level of trust in the oil markets is a more relevant

\(^{217}\) In the plausibility probe, the two were basically given the same weight.

\(^{218}\) In the language of set-theoretic ideas that underlie the proposed model, adopting a high level of strategic oil supply measures (Y) is a minute subset of the necessary condition of the presence of oxygen (X1) and a larger subset in the necessary condition of having a high level of trust (X2).
necessary cause to the adoption of high level of strategic oil supply measures than having a high overall implementation capability.

The high level of strategic oil measures adopted by Taiwan in the decade leading to 2013 resulted more from the state not having a high capacity, as expounded by Ikenberry, to wield market instrument decisively than from the state actively trying to control oil supply to the economy.\(^{219}\) The Taiwanese government clearly recognised the value of economic liberalisation and tried to privatise its NOC and let oil product prices float by this century, but it ran into stiff resistance from the trade union. Taiwanese decision-makers were also very sensitive to the pressure of populist demand for artificially low oil prices. Taiwan’s precarious geopolitical situation facilitated securitising the island’s oil supply, enabled the government at times to be “captured” by an oligopolistic private oil firm, and generally made decision-makers more risk averse. All these situations combined to lowed decision-makers’ overall trust in relying solely on the market to supply oil to the economy.

Chapter Six
Oil Sector Liberalisation, Fast and Slow

This thesis has evaluated the puzzling phenomenon that many governments of net oil importing economies continued to intervene in their economies’ oil supply well after oil began trading in open international markets. This was the case even though many domestic oil markets have been liberalised to varying degrees during the same period. State-sponsored oil supply activities re-emerged as an important issue in international political economics in the first decade or so of this century due to rising oil prices. The focus of related commentary and research has been the overseas hydrocarbon exploration and production (E&P) activities of Chinese national oil companies (NOCs). Upon closer examination, however, many other Asian net oil importing economies also adopted different levels and types of what this study labels strategic oil supply measures.

Neither neoliberal economists nor Realist/geopolitical theorists seem to have satisfactorily answered the two key research questions generated from this puzzle. These are (1) What explains variations in the levels of strategic oil supply measures adopted by Asian net oil importing economies between 1994 and 2013; and (2) what explains the adoption of a high level of such measures by at least some of those economies during this period?

The goal of this study has been to delineate and assess the circumstances that resulted in continuing but differing levels of state intervention in the oil sectors of Asian net oil importing economies. The puzzle of the study embodies at least two implicit assumptions. First, the open market is generally a more efficient way of obtaining oil supplies. Second, states aim to adopt the most efficient measures to obtain oil supplies to underwrite their economies. As discussed further below, a more nuanced understanding of these assumptions has emerged during the investigations undertaken in the previous chapters to unlock the apparently puzzling phenomenon that motivated this thesis.

Without assigning prescriptions of what states should or should not do to their oil sector governance, what would be the contribution of studying the causes for oil dependent states to intervene in the oil marketplace to international relations? First, it may highlight misconceptions of what underwrites the motives of state actions in the oil sector. Such misunderstandings would otherwise have a damaging effect on international and regional relationships given the relative prominence of the zero-sum (neorealist) narrative of resource acquisition policy calculations.

1 The title of this chapter is homage to the book by the Nobel laureate Daniel Kahneman, Thinking, Fast and Slow (New York: Farrar, Straus & Giroux, 2011).
Second, despite the many worthy studies on more sustainable and renewable energy sources that have been developed in recent years, oil is - and likely will remain - an important energy source of the world in the coming decades. In the Asia Pacific, oil consumption as a percentage of primary energy was a little lower than the global average in the decade preceding 2013. As the only region where coal accounts for a larger share of primary energy source than oil, however, it may be relatively better for the global environment if Asia increases the use of natural gas and oil, in lieu of coal. Although China has aggressive plans to increase its nuclear capacity to lower its overwhelming reliance on coal, the low base it started from means that there should be simultaneous room for increase in oil and gas and renewable energy usage. Besides, nuclear energy is not a ready substitute of oil or even natural gas in the transportation sector in the foreseeable future, judging by the current state of technological developments. The determinants of the level and mode of state intervention in oil supply, therefore, would still be a consequential issue, especially in the Asia-Pacific.

This study employs a deductive “vulnerability-interaction model” to address the two research questions about the causes to variations in the levels of strategic oil supply measures adopted by Asian net oil importing economies. This model provides a clear and potentially generalisable framework for analysing the causes of continued state intervention in the Asian Pacific oil sector which has so far been lacking in the relevant existing literature. The model proposes that a polity having a noticeable level of oil vulnerability (OV) is a

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3 In 2004, oil accounted for about 34% of the Asia-Pacific’s and 37% of the world’s primary energy consumption, while that figure for the Asia Pacific in 2015 was about 27%. For the 2015 data, see above. For the 2004 data, see BP Statistical Review of World Energy June 2006, 41.

4 Same data source as in footnote 3.


sufficient but not necessary cause for its decision-makers to desire to adopt strategic oil supply measures. The actual level of these measures adopted at any given time - the dependent variable (DV) - is the result of interaction among the economy’s OV and three other factors within a given polity: (1) the level of decision-makers’ trust that oil markets can supply reliable and affordable oil to the economy, (2) the economy’s overall implementation capability of strategic supply measures; and (3) the overall strength of private capital versus that of state capital in the economy.

The vulnerability-interaction model specifies the result of the interaction of these explanatory variables in four cases. The two hypothetical “extreme cases” according to the reasoning of the model are: (1) a net oil importing economy with a low OV, high trust, low capability, and high strength of private capital would adopt a low level of interventionist or strategic oil supply measures or none at all; or (2) one with a high OV, low trust, high capability, and low strength of private capital would adopt a high level of such measures. Each of these extreme cases or the groupings of explanatory variables as a whole forms an unnecessary but sufficient pathway to the adoption of respectively a low and a high level of strategic oil supply measures.

Short of these extreme cases, the model hypothesises two pathways or INUS causes for the adoption of a high level of strategic oil supply measures. These are: (1) net oil importing economies with high OV, medium trust in oil markets, high capability, and high-strength private capital versus that of the state (H3 or Three-High cases); and (2) ones with a noticeable level of OV, high capability, NOT having high trust in oil markets, nor high-strength private capital (H4 or Non-Three-High cases).

In response to the first research question of what causes the variations in strategic oil supply measures adopted, the vulnerability-interaction model predicts the comparative levels of strategic oil supply measures adopted by two net oil importing economies at the same period or by the same economy in two distinct periods under two situations. They are encapsulated in the following two hypotheses. H1 states that if the levels of all four explanatory factors are similar, the value of the DV should be similar. H2 contends that if the levels of three factors are similar in two cases, their DV levels should be congruent with the result caused by the difference in their fourth factor as predicted by the proposed model. If the only difference among the explanatory variables between two economies is that one has a higher trust in oil markets, for example, H2 predicts that the one with a higher trust would adopt a lower level of strategic oil supply measures.

7 INUS is the acronym of “an insufficient but necessary part of a condition which is itself unnecessary but sufficient for the result.” James Mahoney, “Toward a Unified Theory of Causality,” *Comparative Political Studies* 42:4/5 (2008), 418.
Due to the previously untested nature of the model, this thesis conducts a plausibility probe in Chapter Three with relatively uniform and simpler data of nine Asian net oil importing economies to gauge if the model’s premise is credible. The results show the vulnerability-interaction model offers a plausible explanation for variation in the level of the state intervention in oil supply of net importing economies. Out of the 36 pairs of cross-case comparisons generated from the nine economies’ 2013 data, one pair, India and Thailand, matches the parameters of H1, meaning the levels of all their four explanatory variables were the same. Both also adopted the same trichotomous level of strategic oil supply measures in 2013, congruent with the expectation of H1. Five pairs of these comparisons emerge with parameters of H2, meaning the levels of three out of their four explanatory variables were the same in 2013. Three out of these five pairs, or 60 percent of the pertinent cases, have DV levels that conform to the expectation of H2. The only substantive difference between the four explanatory variable levels between China and India was China’s markedly higher implementation capability and China had a higher DV as predicted by H2. The same is true for China and Thailand. The only substantive difference in the four explanatory variable levels between Japan and Singapore again was Japan’s higher implementation capability. Japan also had a higher DV as predicted by H2.

Chapter Three also examines the cross-temporal validity of the vulnerability-interaction model by comparing the 2013 data of the nine economies with commensurate 2003 data. These two data points represent roughly the end of one decade of high and low oil prices in the international markets respectively. Four of these nine within-case studies emerged with no change in the levels of any of their four explanatory variables over the decade. Among the four, two are congruent with the predictions of H1, meaning no change was evident in the level of the strategic oil supply measures they adopted, as expected. Two of the cases match the parameters of H2. Judged by a adherence to the letters of the hypothesis only, neither’s DV level changed in the direction predicted by the change of the one explanatory variable having a trichotomously different level over the decade. As detailed in Chapter Three, however, both conform to the reasoning of the proposed model.

The findings of the levels of the variables of the nine economies in the preliminary study are used to gauge the initial plausibility of the two pathways hypothesised to explain the adoption of a high level of strategic oil supply measures, H3 and H4. Taiwan’s situation was the most appropriate for further investigation of the pathway resulting in the adoption of a high level of strategic oil supply measures by a generally open and free economy. On the other hand, China’s 2013 data match all the stipulations of H4.

Chapter Four presents more detailed data to investigate the cross-case validity of H1 and H2. India and Thailand are selected as the country pair for examining H1 because all their explanatory variables are identified as having the same levels in the plausibility
probe. After more detailed and country-specific data are taken into account, the trichotomous levels of all their variables remain the same. The cross-case validity of H1, therefore, passes the test of the most different research design considering the great differences between the two countries. These include many respects other than the explanatory variables, such as population, geographical size, political and economic systems. Future research may investigate if the specific configuration of these two countries’ four explanatory variables in 2013 is a reliable causal pathway to the adoption of a medium level of strategic oil measures: medium implementation capability and low level of the remaining three explanatory variables.

Among the three pairs of cases preliminarily congruent with the predictions of H2, China and India are chosen to further investigate the hypothesis’ validity. Their respective explanatory and dependent variable levels in the plausibility probe withstand the scrutiny of more detailed data in the second half of Chapter Four. China’s markedly higher implementation capability continues to be the determining factor that explains the higher level of strategic oil supply measures it adopted in the years leading to 2013. While the values of the other three explanatory variables change slightly after more data are analysed, they do not warrant changes in trichotomous levels. The cross-case validity of H2, therefore, is also confirmed. Since China’s configuration match that of H4, this comparative study also serves as a confirmation of the causal pathway to the adoption of a high level of state intervention in the oil sector suggested by H4 – those of the non-three-high cases.

Chapter Five investigates Taiwan’s pathway to the adoption of a high level of strategic oil supply measure in an effort to further investigate and refine H3. Under closer examination, Taiwan’s conditions in the decade preceding 2013 still did not conform totally, but moved closer to, the stipulations of H3. Most importantly, the polity’s overall trust in the oil markets was lowered to a trichotomously medium, not high, level as in the preliminary study. The vulnerability-interaction model conceptualises the level of trust in oil markets as the central explanatory variable that “binds” all the others together. Not having a high level of trust, therefore, is hypothesised as one of the two *a priori* conditions that leads net oil importing economies to adopt a high level of strategic oil supply measures.

Having a high implementation capability was originally deduced to be the other *a priori* condition. Taiwan’s capability as of 2013 still did not reach an overall high level, despite its high financial capability even by global standards. This was mainly due to its ambiguous sovereign status in the international arena and its diplomatic isolation. Future research may test the idea that having at least a medium overall capability is a more appropriate *a priori* condition. Alternatively, diplomatic capability probably contributes less to the overall implementation capability than is currently formulated. The findings on Taiwan as well as those on other case studies gleaned from both the plausibility probe and
the in-depth paired comparisons suggest that implementation capability is of secondary importance compared to trust in oil markets and possibly path dependency. In the parlance of the set-theoretic method of social sciences that underpins this thesis, implementation capability is a less relevant necessary pre-condition for the adoption of a high level of strategic oil supply measures than is trust.8

Of the four economies in the plausibility probe that receive a low trust level score in oil markets in this study - China, India, Indonesia, and Thailand - none of them had a low DV level in 2013. On the other hand, of the two polities that had high capabilities, only China - (also having a low trust level) - implemented a high level of strategic oil supply measures in 2013. Japan, the other high-capability economy, had a higher trust in oil markets. Even with a high OV, it only had a medium, not high, level of DV.

The case of Taiwan shows that once a national oil company (NOC) was established, it becomes very “sticky,” meaning the divestment process tends to be long and arduous. Of the nine cases studied in this thesis, only Singapore’s NOC was totally divested. All the other eight began some sort of divestment or corporatisation process about two decades earlier, but none of the NOCs has become minority government-owned yet. NOCs tend to justify their existence by exaggerating their importance in ensuring reliable and affordable oil supply to decision-makers and the public of their host economies. They also sometimes unduly link oil supply with national and international security concerns. All these tend to lower decision-makers’ trust in the oil markets. NOCs are also competitors of private capital in the oil sectors. These two situations form a feedback loop that reinforces both factors.

Overall Implications of Thesis

In the meantime, a broader understanding of the apparent tension between the drive for greater oil sector liberalisation and the continued intervention in the sector emerges from the analysis presented in this study. First, oil governance globally has generally been moving towards being more transparent and supply-and-demand-driven with the establishment of the open international oil markets in the last three decades than in previous eras. This was not only true in advanced industrial economies,9 but also in the Asia-Pacific, including China and India. The cross-temporal study in this thesis shows that seven out of the nine case studies adopted either the same or a lower level of strategic oil supply measures over a

8 For a discussion of the relevance or trivialness of necessary and sufficient conditions, see Carsten Q. Schneider and Claudius Wagemann, Set-Theoretic Methods for Social Sciences (Cambridge: Cambridge University Press, 2012), Chapter 9, Kindle Edition.
9 See Hughes, Globalizing Oil.
decade of rising oil prices. The marketisation and later financialisation of the international oil markets was facilitated by the increasing number of non-OPEC oil exporting countries and advancements in oil E&P and information technologies. This process is analogous to a long-term “evolution” towards the equilibrium of a more efficient mode of exchange at the global or “population of states” level.

Decision-makers in individual net oil importing states, while also striving for efficient oil supply to their economies are nevertheless akin to managers confronted with the subjective costs associated with the unique conditions of their respective economies (firms) at a particular point in time. To them, “[e]conomic costs are inherently subjective, because different decision makers sacrifice different alternatives at the moment of choice based on different perceptions of and preferences for the alternative opportunities in a world of uncertainty.” Figuratively, decision-makers’ political imperative to live to fight another day or serve another term is mostly predicated on issues that have shorter time horizons. Energy or oil supply security and efficiency is only one of the many issues on their policy plates, and under most circumstances, the issue of reliable oil supplies is not raised to the highest level of urgency or importance. Sometimes, strategic oil supply measures are adopted because of reasons not related to oil supply security or efficiency, such as to serve more urgent political or diplomatic objectives. Again, as with individual firms, “in the short run, disequilibrium prevails, and both efficient and inefficient forms [of governance] will be observed to coexist.”

Taiwan and China, for example, both adopted a high level of strategic oil supply measures up to 2013 by global standards. Decision-makers in both economies, however, appeared to agree that a liberalised oil sector is more efficient to fuel their respective economies. Still, they did not or could not liberalise their oil sectors at a faster pace. This was due to many competing objective demands and restraints in their own polity, as well as decision-makers’ perceptions of the polities’ domestic and external environments, which in turn determined their risk preferences.

The vulnerability-interaction model suggests that the narrative of the aggressive zero-sum form of economic nationalism is the major “tool” securitising agents such as NOCs use to lower decision-makers’ risk preference regarding their polities’ external environment. This is especially true in conducting their relations with the existing

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10 The Philippines and South Korea are the only two exceptions. As detailed in Chapter Three, the Philippines’ level of DV went up but its oil sector was actually more market-oriented over the decade.

11 The insight for the analysis in the non-synchronous speed of oil sector liberalisation at the population (of states) and individual states levels originates from the discussions of the two different levels of transaction cost economics by Chiles and McMackin in “Integrating Variable Risk Preferences, Trust, and Transaction Cost Economics.”

12 Chiles and McMackin, 77.

13 Ibid., 76.
hegemonic power of the United States. China was the one case-study polity that had a neutral-conflictual relationship with the United States in 2013, which has since deteriorated further. In the meantime, the zero-sum form of economic nationalism has been crescendoing in some parts of the world, not the least in the United States. This does not seem to bode well for expedited oil sector liberalisation in China, even with the lowering of oil prices in the international markets since 2014.

The cross-temporal study in this thesis also suggests that oil price changes by themselves seem to have a less prominent effect on the level of strategic oil supply measures adopted than both changes in oil self-sufficiency rates and trust in the oil markets.\(^\text{14}\) China’s oil self-sufficiency rate is likely to keep declining unless there are major breakthroughs in oil E&P and/or transport fuelling technologies, or if its economy significantly worsens and hence curbing the demand for cars by its expanding middle class. If the latter happens, it would likely make the zero-sum form of economic nationalism more marketable and so erode decision-makers’ trust in the international oil markets. Therefore, there seems to be no easy way to hasten China’s oil sector liberalisation, but quite a few ways to slow it down.

The same observation of the relative importance of oil-sufficiency rate should have the opposite effect on the United States and other economies that can significantly enhance their oil self-sufficiency rates with technologies associated with the shale revolution. These technologies enabled the United States to increase its oil sufficiency rate from just shy of 40% in 2010 to 65% in 2015.\(^\text{15}\) If everything remains equal, the United States should adopt a lower level of strategic oil supply measures. This was true in the form of the lifting of its four-decade export ban on crude oil in December 2015. Everything does not remain equal, however. Somehow the rhetoric of a more or less zero-sum form of economic nationalism has moved into mainstream politics in the United States, if not particularly in the oil sector. This simultaneous objective increase in oil supply security and subjective increase in general “paranoia” of U.S. decision-makers is likely to generate greater risk aversion of “managers” of polities not having friendly relations with the United States. In their estimation, the “prophecy” of the zero-sum economic nationalistic narrative is being fulfilled.

Whether the course of actions chosen by managers of individual firms or economies according to the subjective costs confronting them in the short run are sufficiently viable to ensure a long-term existence or even prosperity can only be known \textit{ex post}. This is especially true when the economy in question is very large and hence has great market power. In this\(^\text{14}\) This is not to suggest that oil price itself has no effect on the level of strategic oil supply measures adopted by governments of net oil importing economies at all. It definitely does. For example, the Indian government has further relaxed oil product control since the drop of oil prices in the second half of 2014. Floating oil prices did not appear to be as politicised during the Taiwanese presidential election in 2016 as in the previous few elections when oil prices were high.\(^\text{15}\) Calculated with the data on the \textit{BP Statistical Review of World Energy June 2016}, 8-9.
study, these are China, Japan, or India. One major factor that would contribute to where the population-of-states level long-term equilibrium of oil sector governance would be is how uniformly and quickly other oil importing economies around the world liberalise their oil sectors. Another factor is the pace of innovation and dissemination of cost-saving technologies and modes of exchange, including alternative energy technologies. The prevalence or change in dominant global economic-political ideas, such as being free-trade-oriented or protectionist, would also be pivotal.16

A more nuanced understanding of the two implicit assumptions underlying the puzzle of this thesis emerges after the research was carried out to explain it. The open market is indeed generally more efficient, but only in a long-term evolutionary sense and comparing to the modes of exchange of oil in previous eras. For the second assumption, states do generally aim at using the most efficient way to obtain oil supplies, especially in the long run, due to the pressure of trying to remain competitive at the global level. Most decision-makers, however, operate in a short to medium horizon. They are confronted with short-term subjective costs and risk perceptions, which may diverge at least temporarily from the states’ long-term objectives.

The timeframe embodied within this study’s research questions targets the medium-term and the geographic scope can also be described as “medium” – between the global population-of-states level and the level of individual economies. The operationalisation of the research, however, is at the individual economy level and the relatively short time of 10 years in each period. The reasoning of the vulnerability-interaction model also fits into the short to medium time horizon of typical decision-makers as trust and risk preference is hypothesised as the central explanatory variable through which all the other explanatory variables flow.

The puzzle that motivated this study can be unlocked by viewing it through the lenses of the two overlapping horizons and levels of analysis explained here. The increasing trading volume and sophistication of the international oil markets is a manifestation of the long-term “evolution” towards a more efficient mode of exchange in oil internationally and oil sector liberalisation domestically for the last four decades. The simultaneous adoption of various levels of strategic oil supply measures by different net oil importing states can be explained by the inherently subjective cost calculations of decision-makers of these states in the short to medium term. The vulnerability-interaction model projects the most important factors that feature in the decision-makers’ calculation of what degree such measures should be adopted at any given time.

16 For the first 80 years or so years of oil as a global commodity, for example, the “equilibrium” was intra-company transfers among “private” firms of colonial and dominant powers of the day.
Roughly analogous to Daniel Kahneman’s assertion of the necessity of both the fast and slow modes of thinking for human decision-making and survival in *Thinking, Fast and Slow*, the two timeframes and speeds of oil sector liberalisation co-existed in the last 40 years. In the Asia Pacific, a region where multinational institutions have been relatively weak, cooperation among net oil importing states to optimise their market power and to establish stability of supply (reaping long-term benefits) was repeatedly countered by the instinct to compete and survive (dealing with short-term subjective costs and risk perceptions). Yet, major regional conflicts over the acquisition of oil resources have been avoided in the region. With continued good fortune, these asynchronous oil sector liberalisations will persist in moving towards a long-term equilibrium of ever greater efficiency and benefit to that region and to the world, perhaps even until the obsolescence of oil as a form of energy is reached.

**Agenda for Future Research**

With the understanding of the timeframe and level of analysis applicable to the vulnerability-interaction model as stated above, future research may further test its validity. Data from more net oil importing economies should be gathered first inside and then outside of the Asia Pacific in distinct periods after the establishment of the international oil market. The proportion of the economies which adopted a high, medium, or low level of strategic oil supply measures would provide better insights to the prevalence of these measures. Any temporal trend(s) and geographic pattern of state intervention in oil supply, if any, would become more discernible if enough cases are studied. The relatively small sample in this study shows that in the Asia Pacific, state intervention oil supply was still significant as of 2013 (33% of the cases at a high, 44% at a medium, and 22% at a low level or none at all).

The factors or combination of factors that led to the adoption of a high level of strategic oil supply measures in the new cases should be carefully analysed and compared to those stipulated in H3 and H4 of the vulnerability-interaction model to refine, modify, or refute these hypotheses. Any commonalities emerge as a result may augment the typologies of intervention in oil supply by net oil importing economies started in this study.

Last but not least, the validity of the underlying logic of the vulnerability-interaction model, namely the proposed causal relationships between the four explanatory factors with the level of strategic oil supply measures adopted, may be tested with the new

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cases. One way to achieve this is to analyse pairs of cases that fit the parameters of H1 and H2.

The slump in oil prices since 2014 and the almost simultaneous rise in economic nationalism rhetoric in many parts of the world offer a great opportunity to study the cross-temporal validity of the logic of the vulnerability-interaction model. In particular, the preliminary insight of this study that change in oil prices only has a relatively small effect on the level of state intervention in oil supply compared to change in oil self-sufficiency rate and securitisation-induced lower trust in the oil market may be tested in the same net oil importing economies before and after these two benchmark events.
Appendix A
Typologising Adoption of High-Level State Intervention in Oil Supply

With four explanatory variables at trichotomous levels, the vulnerability-interaction model would have generated 81 mathematically possible pathways or configurations of arriving at the adoption of a high level of strategic oil supply measures ($3^4 = 81$). The proposed model then specifies two *a priori* conditions for such a result. This shrinks the possible pathways or cells to 18 as presented in Figure 2.4 in Chapter Two. After applying the logical compression technique in Section 4.3, five more pathways or cells are deleted (See Figure 2.5). Thirteen pathways leading to a high level of DV remains with trichotomous variables. Each one of these pathways is hypothesised as an INUS cause of the adoption of a high level of strategic oil supply measures by an oil importing economy. These pathways are:

1. high capability + low trust + low private capital strength + low OV
2. high capability + low trust + low private capital strength + medium OV
3. high capability + low trust + low private capital strength + high OV
4. high capability + low trust + medium private capital strength + low OV
5. high capability + low trust + medium private capital strength + medium OV
6. high capability + low trust + medium private capital strength + high OV
7. high capability + medium trust + low private capital strength + low OV
8. high capability + medium trust + low private capital strength + medium OV
9. high capability + medium trust + low private capital strength + high OV
10. high capability + medium trust + medium private capital strength + low OV
11. high capability + medium trust + medium private capital strength + medium OV
12. high capability + medium trust + medium private capital strength + high OV
13. high capability + medium trust + high private capital strength + high OV

Then the technique of pragmatic compression is applied as explained in Chapter Two. This combines the components or “solution terms” of these pathways if doing so does not change the essence of the model. A careful examination of the solution terms of the 13 pathways above shows that the first three pathways or solutions only differ in the level of their last component, which is OV. Therefore, the property space or cell of these three pathways can be pragmatically compressed as follows:

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1 In research using set-theoretic methods, each component in a pathway leading to the phenomenon of interest is called a solution term. See Schneider and Wagemann.
A. high capability + low trust + low private capital strength + noticeable level of OV

The same procedure can be carried out for pathways 4 to 6; 7 to 9; and 10 to 12. Each of these groups also only differs in the level of their last component, again the OV. This will result in the following collapsed pathways for each group respectively:

B. high capability + low trust + medium private capital strength + noticeable level of OV
C. high capability + medium trust + low private capital strength + noticeable OV
D. high capability + medium trust + medium private capital strength + noticeable OV

Now if we look at A to D more closely, we can see that the same pragmatic compression principle can be used to merge them into a single pathway as follows:

E. high capability + NOT high trust + NOT high private capital strength + noticeable OV

At the end, two final pathways or INUS causes to a high level of DV emerge with trichotomous variables after all the compression is done: pathway 13 and pathway E. They also become H3 and H4 respectively:

H3: high capability + medium trust + high private capital strength + high OV
H4: high capability + NOT high level of trust + NOT high private capital strength + noticeable level of OV

Figure A1 below is a graphic representation of the INUS causes for the adoption of a high level of strategic oil supply measures by net oil importing economies with trichotomous variables. The greyed out cells are logically compressed (equivalent to cell group 2 in Figure 2.5):

![Figure A1 Typology of Adoption of High Level of Strategic Oil Supply Measures](image-url)
Table A1 below shows different strategic oil supply indicator scores resulting from different aggregation of its two components methods with and without capping the SPR score and weighting given to it.

<table>
<thead>
<tr>
<th>Country</th>
<th>DV with 90 days of import as 100% of SPR for 2013, results of different weights of aggregation</th>
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<tbody>
<tr>
<td></td>
<td>% govt control of oil supply</td>
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<td>China</td>
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<tr>
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<td>44.00</td>
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<tr>
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</table>

Table A1: 2013 DV scores of nine case-study economies with different aggregation methods and weightings.
Table A2 below shows different trichotomous DV levels of all case studies in 2013 resulting from different aggregation and weighting methods of the two components of the strategic oil supply indicators. As a rule, for all weighting methods, DV scores within one standard deviation of the average (falling within 0.5 above and 0.5 below the mean DV score of the weighting method in question) are considered having a medium level. DV scores more than 0.5 standard deviation above the average are considered having a high level and those 0.5 or more below are considered having a low level.

<table>
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<th>DV equalweight</th>
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<td>China</td>
<td>58.94</td>
<td>0.32</td>
<td>43.38 (average)</td>
<td>high</td>
</tr>
<tr>
<td>India</td>
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<tr>
<td>Singapore</td>
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<td>high</td>
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<tr>
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<th>DV equalweight SPR capped at 100%</th>
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Table A2  Different trichotomous levels DV of nine case-study economies in 2013 with different aggregation and weighting methods
Table A3 in the next page shows the calculation of the oil vulnerability of all nine case-study economies in 2013. The sources of oil production, consumption, and primary energy consumption data are from BP Statistical Review of World Energy June 2014 except stated otherwise. The Philippines’ oil production amount is from the U.S. Energy Information Administration database online. Population and per capita income data are from the World Bank except for Taiwan, which is from the Central Intelligence Agency. “The World Factbook.”

<table>
<thead>
<tr>
<th>Country</th>
<th>ProdK Kbl</th>
<th>Cons Kbl</th>
<th>oil self-sufficiency rate</th>
<th>sufficiency normalized</th>
<th>glob import Mton</th>
<th>oil as % of global import</th>
<th>primary energy cons Kbl</th>
<th>oil as % of primary energy</th>
<th>prodK Kbl</th>
<th>consK Kbl</th>
<th>OilV</th>
<th>OilV US$bl</th>
<th>Population</th>
<th>per cap import cost</th>
<th>per cap GDP</th>
<th>import cost</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>208.13</td>
<td>597.28</td>
<td>41.02</td>
<td>68.98</td>
<td>1878.80</td>
<td>15.83</td>
<td>2352.56</td>
<td>17.76</td>
<td>417929</td>
<td>10756.81</td>
<td>105.47</td>
<td>1,357,880,008</td>
<td>12,211</td>
<td>0.0013</td>
<td>25.18</td>
<td>0.0042</td>
<td>23.18</td>
</tr>
<tr>
<td>India</td>
<td>41.95</td>
<td>175.23</td>
<td>23.94</td>
<td>76.05</td>
<td>1878.80</td>
<td>7.10</td>
<td>394.96</td>
<td>29.46</td>
<td>894.22</td>
<td>5,726.51</td>
<td>105.47</td>
<td>1,252,139,596</td>
<td>10,641</td>
<td>0.0004</td>
<td>27.13</td>
<td>0.0048</td>
<td>28.13</td>
</tr>
<tr>
<td>Indonesia</td>
<td>42.70</td>
<td>133.83</td>
<td>57.84</td>
<td>42.16</td>
<td>1878.80</td>
<td>6.65</td>
<td>168.68</td>
<td>43.77</td>
<td>882.17</td>
<td>1622.68</td>
<td>105.47</td>
<td>249,865,631</td>
<td>10,011</td>
<td>0.0051</td>
<td>21.90</td>
<td>0.0031</td>
<td>23.00</td>
</tr>
<tr>
<td>Japan</td>
<td>0.00</td>
<td>208.92</td>
<td>0.00</td>
<td>100.00</td>
<td>1878.80</td>
<td>11.12</td>
<td>474.01</td>
<td>44.08</td>
<td>0.00</td>
<td>45,50.56</td>
<td>105.47</td>
<td>127,388,621</td>
<td>5.7691</td>
<td>0.0015</td>
<td>38.83</td>
<td>0.0010</td>
<td>38.83</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.10</td>
<td>13.67</td>
<td>8.05</td>
<td>91.95</td>
<td>1878.80</td>
<td>0.67</td>
<td>31.77</td>
<td>45.93</td>
<td>0.00</td>
<td>29.76</td>
<td>105.47</td>
<td>98,993,574</td>
<td>6,588</td>
<td>0.0046</td>
<td>35.01</td>
<td>0.0045</td>
<td>35.01</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.00</td>
<td>65.92</td>
<td>0.00</td>
<td>100.00</td>
<td>1878.80</td>
<td>3.51</td>
<td>75.87</td>
<td>87.12</td>
<td>0.00</td>
<td>12.38</td>
<td>105.47</td>
<td>5,359,200</td>
<td>80.78</td>
<td>0.0304</td>
<td>47.66</td>
<td>0.0304</td>
<td>47.66</td>
</tr>
<tr>
<td>South Korea</td>
<td>0.00</td>
<td>108.45</td>
<td>0.00</td>
<td>100.00</td>
<td>1878.80</td>
<td>5.77</td>
<td>271.23</td>
<td>39.97</td>
<td>0.00</td>
<td>245.86</td>
<td>105.47</td>
<td>50,432,959</td>
<td>32,654</td>
<td>0.0130</td>
<td>36.44</td>
<td>0.0135</td>
<td>36.44</td>
</tr>
<tr>
<td>Taiwan</td>
<td>0.00</td>
<td>43.29</td>
<td>0.00</td>
<td>100.00</td>
<td>1878.80</td>
<td>2.34</td>
<td>110.89</td>
<td>39.13</td>
<td>0.00</td>
<td>97.73</td>
<td>105.47</td>
<td>23,413,128</td>
<td>42,600</td>
<td>0.0101</td>
<td>35.26</td>
<td>0.0101</td>
<td>35.26</td>
</tr>
<tr>
<td>Thailand</td>
<td>16.63</td>
<td>50.41</td>
<td>32.99</td>
<td>67.01</td>
<td>1878.80</td>
<td>1.80</td>
<td>115.61</td>
<td>45.80</td>
<td>458.98</td>
<td>1211.14</td>
<td>105.47</td>
<td>67,010,902</td>
<td>15,437</td>
<td>0.0077</td>
<td>28.17</td>
<td>0.0077</td>
<td>28.17</td>
</tr>
</tbody>
</table>

Table A3 Calculation of 2013 OV
Figure A4 below lays out overall implementation scores and levels of nine case-study economies in 2013 with Singapore coded as anocracy, autocracy, or democracy. Singapore’s overall implementation level does not change in these three scenarios, but Thailand’s overall capability level would be downgraded to “low” instead of “medium” in the two scenarios not adopted in this study (Singapore being either an autocracy or democracy).

<table>
<thead>
<tr>
<th>Overall financial &amp; diplomatic capability without centralisation scores</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>13</td>
<td>2.05</td>
<td>8.22 (average)</td>
</tr>
<tr>
<td>India</td>
<td>8</td>
<td>-0.10</td>
<td>2.33 (S.D.) medium</td>
</tr>
<tr>
<td>Indonesia</td>
<td>6</td>
<td>-0.95</td>
<td>low</td>
</tr>
<tr>
<td>Japan</td>
<td>10</td>
<td>0.76</td>
<td>high</td>
</tr>
<tr>
<td>Philippines</td>
<td>5</td>
<td>-1.38</td>
<td>low</td>
</tr>
<tr>
<td>Singapore</td>
<td>8</td>
<td>-0.10</td>
<td>medium</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
<td>0.33</td>
<td>medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>8</td>
<td>-0.10</td>
<td>medium</td>
</tr>
<tr>
<td>Thailand</td>
<td>7</td>
<td>-0.52</td>
<td>medium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Centralisation Score with Singapore as anocracy</th>
<th>autocracy</th>
<th>democracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>India</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Philippines</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>South Korea</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Thailand</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall capability with diplomatic &amp; centralisation scores, Singapore as anocracy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>16</td>
<td>2.19</td>
</tr>
<tr>
<td>India</td>
<td>10</td>
<td>-0.08</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8</td>
<td>-0.84</td>
</tr>
<tr>
<td>Japan</td>
<td>12</td>
<td>0.67</td>
</tr>
<tr>
<td>Philippines</td>
<td>7</td>
<td>-1.22</td>
</tr>
<tr>
<td>Singapore</td>
<td>9</td>
<td>-0.46</td>
</tr>
<tr>
<td>South Korea</td>
<td>11</td>
<td>0.30</td>
</tr>
<tr>
<td>Taiwan</td>
<td>10</td>
<td>-0.08</td>
</tr>
<tr>
<td>Thailand</td>
<td>9</td>
<td>-0.46</td>
</tr>
<tr>
<td>Country</td>
<td>Score</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>--------------------</td>
</tr>
<tr>
<td>China</td>
<td>16</td>
<td>2.18</td>
</tr>
<tr>
<td>India</td>
<td>10</td>
<td>-0.13</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8</td>
<td>-0.90</td>
</tr>
<tr>
<td>Japan</td>
<td>12</td>
<td>0.64</td>
</tr>
<tr>
<td>Philippines</td>
<td>7</td>
<td>-1.28</td>
</tr>
<tr>
<td>Singapore</td>
<td>10</td>
<td>-0.13</td>
</tr>
<tr>
<td>South Korea</td>
<td>11</td>
<td>0.26</td>
</tr>
<tr>
<td>Taiwan</td>
<td>10</td>
<td>-0.13</td>
</tr>
<tr>
<td>Thailand</td>
<td>9</td>
<td>-0.51</td>
</tr>
</tbody>
</table>

Table A4  Overall implementation capability of nine economies in 2013, with different centralization scores
Table A5 below shows all 36 pairs of comparison of the variable levels among the nine case-study economies with 2013 data. The pairs with conditions fitting either H1 or H2 are highlighted. The rest have differences in more than one explanatory factor. The vulnerability-interaction model as is currently formulated cannot specify the interaction effect such situations would be on the DV level.

<table>
<thead>
<tr>
<th>Economy</th>
<th>DV Level</th>
<th>OV (IV) Level</th>
<th>Strength of Private Capital</th>
<th>Overall Trust in Oil Markets</th>
<th>Overall Implementation Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>India</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Indonesia</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Japan</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Philippines</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Singapore</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>S. Korea</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Taiwan</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Thailand</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Trichotomous Levels of All Variables for Nine Case-Study Economies in 2013 (same as Table 3.18)

1. China-India: one-level difference in one factor congruent (H2)
2. China-Indonesia: one-level difference in one factor and two-level difference in two factors
3. China-Japan: two-level difference in three factors
4. China-Philippines: one-level difference in three factors and two-level difference in one factor
5. China-Singapore: two-level difference in three factors and one-level difference in one factor
6. China-S. Korea: one-level difference in three factors and one-level difference in one factor
7. China-Taiwan: one-level difference in two factors and two-level difference in two factors
8. China-Thailand: one-level difference in one factor congruent (H2)
9. India-Indonesia: one-level difference in two factors
10. India-Japan: two-level difference in three factors and one-level difference in one factor
11. India-Philippines: one-level difference in four factors
12. India-Singapore: two-level difference in three factors
13. India-S. Korea: two-level difference in two factors
14. India-Taiwan: one-level difference in one factor and two-level difference in two factors
15. India-Thailand: all four factors the same levels congruent (H1)
16. Indonesia-Japanese: two-level difference in three factors and one-level difference in one factor
17. Indonesia-Philippines: one-level difference in two factors
18. Indonesia-Singapore: two-level difference in two factors and one-level difference in one factor
19. Indonesia-S. Korea: one-level difference in two factors and two-level difference in one factor
20. Indonesia-Taiwan: one-level difference in two factors and two-level difference in two factors
21. Indonesia-Thailand: one-level difference in two factors
22. Japan-Philippines: one-level difference in three factors and two-level difference in one factor
23. Japan-Singapore: one-level difference in one factor congruent (H2)
24. Japan-S. Korea: one-level difference in three factors
25. Japan-Taiwan: one-level difference in two factors
26. Japan-Thailand: one-level difference in one factor and two-level difference in three factors
27. Philippines-Singapore: one-level difference in four factors
28. Philippines-S. Korea: one-level difference in two factors
29. Philippines-Taiwan: one-level difference in three factors
30. Philippines-Thailand: one-level difference in four factors
31. Singapore-S. Korea: one-level difference in two factors
32. Singapore-Taiwan: one-level difference in one factor incongruent (H2)
33. Singapore-Thailand: two-level difference in three factors
34. S. Korea-Taiwan: one-level difference in one factor incongruent (H2)
35. S. Korea-Thailand: one-level difference in two factors and two-level difference in one factor
36. Taiwan-Thailand: one-level difference in one factor and two-level difference in two factors

Table A5 36 paired-comparisons of variable levels of nine case-study economies in 2013
Table A6 below shows the average government ownership shareholding in 15 advanced industrialised economies by 2005. Source of the information is mainly from “Appendix: Oil market liberalization in the advanced industrialised states” in Llewelyn Hughes, *Globalizing Oil: Firms and Oil Market Governance in France, Japan, and the United States*. I use the state control of crude oil supply figure in this study for Japan since Japan’s “NOC” is more a government agency facilitating loans for private oil firms to develop oil.

<table>
<thead>
<tr>
<th>Country</th>
<th>% state shareholding in NOC(s)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>31.50 as of 2007</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>0.00 as of 1983</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>61.00 as of 2000</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>0.00 as of 2000</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td>subsidy provision ended in 1989</td>
</tr>
<tr>
<td>Greece</td>
<td>35.40 as of 2004</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>0.00 as of 2001</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>30.8 as of 2000</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>11.00 plausible probe</td>
<td></td>
</tr>
<tr>
<td>Nederland</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>34.80 as of 2000</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>0.00 but govt retained &quot;golden share&quot; as of 1998</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>0.00 as of 1994</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>85.00 average of 100% of upstream NOC as of 2005 and 68.8% downstream NOC</td>
<td></td>
</tr>
<tr>
<td>15-economy average</td>
<td>19.30</td>
<td></td>
</tr>
</tbody>
</table>

Table A6 Government shareholding in NOCs in 15 advanced industrialised countries by 2005
Table A7 below shows the calculation of the oil vulnerability of all nine case-study economies in 2003. The sources of oil production, consumption, and primary energy consumption data are from the BP Statistical Review of World Energy June 2004 except stated otherwise. The Philippines’ oil production amount is from the U.S. Energy Information Administration database online. Population and per capita income data are from the World Bank except for Taiwan, which is from the Central Intelligence Agency’s The World Factbook.

Table A7  Oil Vulnerability of Nine Case Studies in 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>prod Oil</th>
<th>Oil Self-Sufficiency Rate</th>
<th>Oil Self-Sufficiency Rate Normalized</th>
<th>Global Import</th>
<th>% Global Import</th>
<th>Oil as % of Primary Energy</th>
<th>prod K bbl</th>
<th>consume K bbl</th>
<th>Brent Crude US$/bbl</th>
<th>population</th>
<th>per cap import cost</th>
<th>per cap GDP</th>
<th>Import Cost</th>
<th>OV</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1.0589</td>
<td>2.759</td>
<td>0.41</td>
<td>0.72</td>
<td>0.72</td>
<td>0.86</td>
<td>155.42</td>
<td>155.42</td>
<td>81.60</td>
<td>0.097</td>
<td>3.93</td>
<td>0.0017</td>
<td>16.24</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>11.654</td>
<td>11.93</td>
<td>11.702</td>
<td>0.52</td>
<td>0.72</td>
<td>3.23</td>
<td>2.93</td>
<td>2.93</td>
<td>8.15</td>
<td>0.06</td>
<td>3.93</td>
<td>0.0017</td>
<td>21.71</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>10.79</td>
<td>11.702</td>
<td>0.52</td>
<td>0.72</td>
<td>0.72</td>
<td>3.23</td>
<td>2.93</td>
<td>2.93</td>
<td>8.15</td>
<td>0.06</td>
<td>3.93</td>
<td>0.0017</td>
<td>21.71</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>0.00</td>
<td>2.5190</td>
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<td>0.00</td>
<td>1.43</td>
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<td>0.17</td>
<td>0.00</td>
<td>0.17</td>
<td>0.00</td>
<td>0.00</td>
<td>12.11</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>0.70</td>
<td>0.78</td>
<td>0.57</td>
<td>0.72</td>
<td>0.72</td>
<td>3.23</td>
<td>2.93</td>
<td>2.93</td>
<td>8.15</td>
<td>0.065</td>
<td>3.93</td>
<td>0.0001</td>
<td>12.11</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>0.00</td>
<td>2.5190</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.43</td>
<td>0.17</td>
<td>0.17</td>
<td>0.00</td>
<td>0.17</td>
<td>0.00</td>
<td>0.00</td>
<td>12.11</td>
<td></td>
</tr>
<tr>
<td>S. Korea</td>
<td>0.00</td>
<td>2.5190</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.43</td>
<td>0.17</td>
<td>0.17</td>
<td>0.00</td>
<td>0.17</td>
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<td>0.00</td>
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Table A8 below shows the DV calculation and sources for the nine case-study economies in 2003.

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<th>% govt control of oil supply</th>
<th>SPR days</th>
<th>SPR %</th>
<th>DV Score with SPR 50% weight, no cap</th>
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</table>

All Chinese oil importers were 100% state-owned in 2003.

The Singapore government had divested all its shares in SPC Limited already by 2003.

Source of Indian government control of oil supply are calculated from the government shareholding of the same five NOCs listed in Chapter Three, with their respective production or refining amount from their respective annual reports of relevant years.


Source of the Philippines’ oil production is from the U.S. Energy Information Agency website. The amount is multiplied by 60% (its share of oil developed in the country).

Source of South Korea’s NOC production figure: KNOC Annual Report 2005, 15.

Source of Taiwan’s government control figure is from CPC 2007 Sustainability Report (in Chinese), 10. (which gives 2006 figures and that’s the closest year I can retrieve).


Indonesia’s SPR figure calculated from 20 days times the country’s self-sufficiency rate in 2003 of about 90%.


Source of Taiwan’s SPR in 2003 same as source in 2013.

Source of Thailand’s SPR figure: Since 2001, oil importers had to stockpile no less than 36 days equivalent of sales. See Poompat Leesombatipiboon, “Thailand’s Energy Security: Strategic Petroleum Reserve and Its Economic Impacts” (PhD diss., George Washington University, 2010) 151. The 36 days figure is multiplied by 0.99 (for the 69.28% government shareholding of PTT in 2003 and then divided by 0.777 (Thailand imported 77% of its oil that year).
Table A9 below shows the calculation of the levels of all the variables of nine case studies in 2003.

<table>
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<tr>
<th>2003</th>
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<th>combined economic freedom score</th>
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**combined economic freedom score**

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**DV equal weight**

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**DV equal weight SPR capped at 100%**

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source of urban population except Taiwan: http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=TH

source of Taiwan urban population: social indicator 2005, page 166

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<th>Country</th>
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<td>India</td>
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source of Taiwan GDP: https://knomensa.com/atlas/Taiwan-Provence-of-China/GDP-per-capita-PPP-based

source of per capita GDP except Taiwan: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?locations=CN&view=chart

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<th>US relations</th>
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<td>Credit Worthiness</td>
<td>Overall Financial Capability</td>
</tr>
<tr>
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<td>-----------------------------</td>
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<td>6.33 (average)</td>
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<td>India</td>
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Source of Singapore's 2001-02 UNSC non-permanent membership:
https://www.mfa.gov.sg/content/mfa_international_organisation_initiatives/unsc.html

Overall capability with diplomatic & centralization scores:

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<th>high</th>
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<td>India</td>
<td>-0.35</td>
<td>2.57 (S.D.)</td>
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<td>Philippines</td>
<td>-1.12</td>
<td>low</td>
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<tr>
<td>Singapore</td>
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<td>medium</td>
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<td>S. Korea</td>
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<td>-0.73</td>
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Table A9 Calculation of levels of variables of nine case studies in 2003
Appendix C
Calculations for Paired Comparisons

Table A10 below shows the sources of crude oil supply of India in 2013 and the calculation of the supply concentration risk associated with it:

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Import</th>
<th>Country Risk at Feb 2014</th>
<th>Normalized country risk</th>
<th>Import risk</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>4.50%</td>
<td>70.8</td>
<td>29.2</td>
<td>1.31</td>
<td>1.73</td>
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<td>Cameroon</td>
<td>0.17%</td>
<td>66.5</td>
<td>35.5</td>
<td>0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>Algeria</td>
<td>0.25%</td>
<td>71.3</td>
<td>28.7</td>
<td>0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Egypt</td>
<td>1.40%</td>
<td>57.8</td>
<td>42.2</td>
<td>0.59</td>
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<tr>
<td>Gabon</td>
<td>0.56%</td>
<td>72.5</td>
<td>27.5</td>
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<td>Guinea</td>
<td>0.34%</td>
<td>44.8</td>
<td>55.2</td>
<td>0.19</td>
<td>0.04</td>
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<tr>
<td>Equatorial Guinea</td>
<td>0.33%</td>
<td>61.53</td>
<td>38.47</td>
<td>0.13</td>
<td>0.02</td>
</tr>
<tr>
<td>Libya</td>
<td>0.58%</td>
<td>61</td>
<td>39</td>
<td>0.23</td>
<td>0.05</td>
</tr>
<tr>
<td>Nigeria</td>
<td>8.80%</td>
<td>64.3</td>
<td>35.7</td>
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<tr>
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<td>0.18%</td>
<td>44.8</td>
<td>55.2</td>
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<td>Chad</td>
<td>0.07%</td>
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<td>UAE</td>
<td>8.30%</td>
<td>83.5</td>
<td>16.5</td>
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<td>1.68</td>
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<td>0.30%</td>
<td>75</td>
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<td>0.20</td>
<td>0.04</td>
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<tr>
<td>Brunei</td>
<td>0.13%</td>
<td>70</td>
<td>30</td>
<td>0.04</td>
<td>0.00</td>
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<td>Brunei</td>
<td>0.55%</td>
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<td>12.7</td>
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<td>0.00</td>
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<tr>
<td>Iran</td>
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<td>37</td>
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<tr>
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<td>37</td>
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<td>Kazakhstan</td>
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<td>0.00</td>
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<tr>
<td>Kuwait</td>
<td>11%</td>
<td>81.3</td>
<td>18.7</td>
<td>2.06</td>
<td>4.23</td>
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<td>Malaysia</td>
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<td>77.5</td>
<td>22.5</td>
<td>0.32</td>
<td>0.10</td>
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<td>Oman</td>
<td>1.09%</td>
<td>81.5</td>
<td>18.5</td>
<td>0.19</td>
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<td>2.70%</td>
<td>82</td>
<td>18</td>
<td>0.49</td>
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<tr>
<td>Saudi Arabia</td>
<td>21%</td>
<td>80.8</td>
<td>19.2</td>
<td>4.93</td>
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<td>Turkey</td>
<td>0.17%</td>
<td>59.3</td>
<td>40.7</td>
<td>0.07</td>
<td>0.00</td>
</tr>
<tr>
<td>Yemen</td>
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<td>62.3</td>
<td>37.7</td>
<td>0.12</td>
<td>0.02</td>
</tr>
<tr>
<td>Albania</td>
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<td>67.8</td>
<td>32.2</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Russia</td>
<td>0.06%</td>
<td>69.5</td>
<td>30.5</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
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<td>0.06%</td>
<td>75.3</td>
<td>24.7</td>
<td>0.02</td>
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<tr>
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<td>72.8</td>
<td>27.2</td>
<td>0.55</td>
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<tr>
<td>Australia</td>
<td>0.21%</td>
<td>77.8</td>
<td>22.2</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Brazil</td>
<td>1.20%</td>
<td>69.3</td>
<td>30.7</td>
<td>0.37</td>
<td>0.14</td>
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<tr>
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<td>32.7</td>
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Data source of crude oil import countries and percentages:

http://atlas.media.mit.edu/us/teste/index.html#20121212


The risk for Chad and E. Guinea is obtained by averaging the other African countries' risk scores assessed by ICRIS.

Table A10 India’s crude oil source concentration risk in 2013
Table A11 below shows the sources of crude oil supply of Thailand in 2013 and the calculation of the supply concentration risk associated with it:

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Import</th>
<th>Country Risk at Feb 2014</th>
<th>Normalized country risk</th>
<th>Import risk</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>0.49%</td>
<td>70.8</td>
<td>29.2</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Algeria</td>
<td>0.71%</td>
<td>71.3</td>
<td>28.7</td>
<td>0.20</td>
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</tr>
<tr>
<td>Equatorial Guinea</td>
<td>0.16%</td>
<td>66.74</td>
<td>33.26</td>
<td>0.05</td>
<td>0.00</td>
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<tr>
<td>Libya</td>
<td>0.19%</td>
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<td>29</td>
<td>0.07</td>
<td>0.01</td>
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<td>0.59%</td>
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<td>35.7</td>
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<td>0.04</td>
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<td>South Africa</td>
<td>0.08%</td>
<td>66.3</td>
<td>33.7</td>
<td>0.02</td>
<td>0.00</td>
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<tr>
<td>UAE</td>
<td>42%</td>
<td>83.5</td>
<td>16.5</td>
<td>6.93</td>
<td>48.02</td>
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<tr>
<td>Azerbaijan</td>
<td>4.90%</td>
<td>75</td>
<td>25</td>
<td>1.23</td>
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<td>Brunei</td>
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<td>87.3</td>
<td>12.7</td>
<td>0.18</td>
<td>0.03</td>
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<td>Indonesia</td>
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<td>1.90</td>
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<td>South Korea</td>
<td>0.28%</td>
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<td>18</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.92%</td>
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<td>18.7</td>
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<td>0.03</td>
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<td>37.2</td>
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<tr>
<td>Malaysia</td>
<td>5.40%</td>
<td>77.5</td>
<td>22.5</td>
<td>1.22</td>
<td>1.48</td>
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<td>18.5</td>
<td>0.95</td>
<td>0.93</td>
</tr>
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<td>28.2</td>
<td>0.06</td>
<td>0.00</td>
</tr>
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<td>Qatar</td>
<td>4.80%</td>
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<td>0.75</td>
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<td>3.26</td>
<td>10.65</td>
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<td>Singapore</td>
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<td>12.7</td>
<td>0.01</td>
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<td>59.3</td>
<td>40.7</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.27%</td>
<td>66</td>
<td>34</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Yemen</td>
<td>4.00%</td>
<td>62.3</td>
<td>37.7</td>
<td>1.31</td>
<td>2.27</td>
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<tr>
<td>UK</td>
<td>0.17%</td>
<td>76.5</td>
<td>23.5</td>
<td>0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Norway</td>
<td>0.13%</td>
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<td>9.2</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Russia</td>
<td>2.80%</td>
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<td>30.5</td>
<td>0.85</td>
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<tr>
<td>USA</td>
<td>0.05%</td>
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<td>24.7</td>
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<tr>
<td>Australian</td>
<td>3.16%</td>
<td>77.8</td>
<td>22.2</td>
<td>0.69</td>
<td>0.47</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0.08%</td>
<td>82.8</td>
<td>17.2</td>
<td>0.01</td>
<td>0.00</td>
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<tr>
<td>Papua New Guinea</td>
<td>0.20%</td>
<td>60.3</td>
<td>39.7</td>
<td>0.12</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Data source of crude oil import countries and percentages:
http://algorithmia.mit.edu/projects/economic-complexity/

The risk of Equatorial Guinea is the average of the other 3 African sources (not provided by ICRG)
The risk of Timor-Leste (not provided by ICRG) is the average of the other 8 countries in the East:
Brunei, Indonesia, S. Korea, Myanmar, Malaysia, the Philippines, Singapore, and Vietnam

Table A11 Thailand’s crude oil source concentration risk in 2013
Table A12 below compares the profitability between Indian and Thai NOCs between 2009 and 2013:

<table>
<thead>
<tr>
<th>NOC</th>
<th>net profit (million rupees)</th>
<th>source</th>
<th>net profit US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONGC 11-12</td>
<td>235,239</td>
<td>p12</td>
<td>12-13 AR</td>
<td>4,470</td>
<td>22.50</td>
<td>p12</td>
</tr>
<tr>
<td>ONGC 10-11</td>
<td>189,240</td>
<td>p11</td>
<td>12-13 AR</td>
<td>4,193</td>
<td>19.60</td>
<td>p11</td>
</tr>
<tr>
<td>ONGC 09-10</td>
<td>187,676</td>
<td>p11</td>
<td>12-13 AR</td>
<td>3,605</td>
<td>19.40</td>
<td>p11</td>
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<tr>
<td>ONGC 08-09</td>
<td>181,243</td>
<td>p11</td>
<td>12-13 AR</td>
<td>3,282</td>
<td>20.70</td>
<td>p11</td>
</tr>
<tr>
<td>5-yr average</td>
<td>$3,913.45</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>IOCL 12-12</td>
<td>20,050</td>
<td>p23</td>
<td>12-12 AR</td>
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<td>9.41</td>
<td>p24</td>
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<td>IOCL 11-12</td>
<td>37,550</td>
<td>p23</td>
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<td>6.95</td>
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<td>p27</td>
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<td>5-yr average</td>
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<table>
<thead>
<tr>
<th>NOC</th>
<th>source</th>
<th>net profit (million rupees)</th>
<th>source</th>
<th>net profit US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
<th>source</th>
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<tbody>
<tr>
<td>Bharat 12-13</td>
<td>p16</td>
<td>19,363.50</td>
<td>p16</td>
<td>12-13 AR</td>
<td>355.9</td>
<td>16.80</td>
<td>p10</td>
</tr>
<tr>
<td>Bharat 11-12</td>
<td>p16</td>
<td>8,512.80</td>
<td>p16</td>
<td>11-12 AR</td>
<td>118.2</td>
<td>9.10</td>
<td>p10</td>
</tr>
<tr>
<td>Bharat 10-11</td>
<td>p16</td>
<td>17,420.80</td>
<td>p16</td>
<td>10-10 AR</td>
<td>389.6</td>
<td>11.40</td>
<td>p10</td>
</tr>
<tr>
<td>Bharat 09-10</td>
<td>p16</td>
<td>17,168.80</td>
<td>p16</td>
<td>09-10 AR</td>
<td>369.3</td>
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<td>7,241.30</td>
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<td>08-09 AR</td>
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<table>
<thead>
<tr>
<th>NOC</th>
<th>source</th>
<th>net profit (million rupees)</th>
<th>source</th>
<th>net profit US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
<th>source</th>
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<td>p11</td>
<td>Hindustan 12-13 AR</td>
<td>168.64</td>
<td>9.50</td>
<td>p11</td>
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<tr>
<td>Hindustan 11-12</td>
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<td>p11</td>
<td>11-12 AR</td>
<td>179.0</td>
<td>9.55</td>
<td>p11</td>
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<tr>
<td>Hindustan 10-11</td>
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<td>15,390.40</td>
<td>p11</td>
<td>11-11 AR</td>
<td>341.0</td>
<td>12.27</td>
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<td>Hindustan 09-10</td>
<td>p11</td>
<td>1,015.70</td>
<td>p11</td>
<td>10-10 AR</td>
<td>287.0</td>
<td>11.26</td>
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<tr>
<td>Hindustan 08-09</td>
<td>p11</td>
<td>5,745.80</td>
<td>p11</td>
<td>09-09 AR</td>
<td>112.0</td>
<td>5.36</td>
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<tr>
<td>5-yr average</td>
<td>$287.33</td>
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<table>
<thead>
<tr>
<th>NOC</th>
<th>source</th>
<th>net profit (rupees)</th>
<th>source</th>
<th>net profit US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
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<tbody>
<tr>
<td>Oil India 2013</td>
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<td>33,982.40</td>
<td>p11</td>
<td>Oil India 2013-14 AR</td>
<td>65.3</td>
<td>8.48</td>
<td>p11</td>
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<tr>
<td>Oil India 2012</td>
<td>p12</td>
<td>34,465.20</td>
<td>p12</td>
<td>Oil India 2012-13 AR</td>
<td>646.6</td>
<td>9.56</td>
<td>p12</td>
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<tr>
<td>Oil India 2011</td>
<td>p12</td>
<td>38,583.90</td>
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<td>Oil India 2011-12 AR</td>
<td>803.7</td>
<td>10.33</td>
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<td>21,616.80</td>
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<td>Oil India 2008-09 AR</td>
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</table>

Indian NOCs 5-yr average | $6,302.54 | 12.77

<table>
<thead>
<tr>
<th>NOC</th>
<th>source</th>
<th>net profit (million Baht)</th>
<th>source</th>
<th>net profits US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTT 2013</td>
<td>p12</td>
<td>94,652.00</td>
<td>p12</td>
<td>PTT 2013 AR</td>
<td>3,100</td>
<td>8.66</td>
<td>p12</td>
</tr>
<tr>
<td>PTT 2012</td>
<td>p12</td>
<td>104,608</td>
<td>p12</td>
<td>2012 AR</td>
<td>3,375</td>
<td>10.45</td>
<td>p12</td>
</tr>
<tr>
<td>PTT 2010</td>
<td>p12</td>
<td>19,348.13</td>
<td>p12</td>
<td>2010 AR</td>
<td>1,754</td>
<td>9.64</td>
<td>p12</td>
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<tr>
<td>PTT 2009</td>
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<td>85,985</td>
<td>p12</td>
<td>2009 AR</td>
<td>2,457</td>
<td>11.56</td>
<td>p12</td>
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<tr>
<td>5-yr average</td>
<td>$2,885</td>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NOC</th>
<th>source</th>
<th>net profit (million Baht)</th>
<th>source</th>
<th>net profits US$ (million)</th>
<th>source</th>
<th>net profits/equity ratio (%)</th>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTT 2013</td>
<td>p13</td>
<td>423,178</td>
<td>p13</td>
<td>PTT 2013 AR</td>
<td>12,787</td>
<td>11.50</td>
<td>p13</td>
</tr>
<tr>
<td>5-yr average</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* https://www.ezraa.com/energy/convert/
date of exchange rate set on 1 Jan of the year in question, such as 1 Jan 2013, 12 etc.

Table A12 below compares the profitability between Indian and Thai NOCs between 2009 and 2013.
Table A13 below shows the sources of crude oil supply of China in 2013 and the calculation of the supply concentration risk associated with it:

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Import</th>
<th>Country Risk at Feb 2014</th>
<th>Normalized country risk</th>
<th>Import risk</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>14%</td>
<td>70.80</td>
<td>29.20</td>
<td>4.09</td>
<td>16.71</td>
</tr>
<tr>
<td>Democratic Rep. of Congo</td>
<td>0.40%</td>
<td>65.00</td>
<td>35.00</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Republic of Congo</td>
<td>2.40%</td>
<td>65.00</td>
<td>35.00</td>
<td>0.84</td>
<td>0.71</td>
</tr>
<tr>
<td>Algeria</td>
<td>0.74%</td>
<td>71.30</td>
<td>28.70</td>
<td>0.21</td>
<td>0.05</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.43%</td>
<td>57.80</td>
<td>42.20</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Gabon</td>
<td>0.17%</td>
<td>72.30</td>
<td>27.30</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Ghana</td>
<td>0.14%</td>
<td>100.00</td>
<td>0.14</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>0.87%</td>
<td>61.53</td>
<td>38.47</td>
<td>0.33</td>
<td>0.11</td>
</tr>
<tr>
<td>Libya</td>
<td>0.91%</td>
<td>61.00</td>
<td>39.00</td>
<td>0.35</td>
<td>0.13</td>
</tr>
<tr>
<td>Mauritania</td>
<td>0.05%</td>
<td>65.00</td>
<td>35.00</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Nigeria</td>
<td>0.45%</td>
<td>64.30</td>
<td>35.70</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.87%</td>
<td>44.80</td>
<td>55.20</td>
<td>0.48</td>
<td>0.23</td>
</tr>
<tr>
<td>South Sudan</td>
<td>1.10%</td>
<td>60.00</td>
<td>40.00</td>
<td>0.44</td>
<td>0.19</td>
</tr>
<tr>
<td>Chad</td>
<td>0.04%</td>
<td>61.53</td>
<td>38.47</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>3.80%</td>
<td>83.50</td>
<td>16.50</td>
<td>0.63</td>
<td>0.39</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>0.03%</td>
<td>75.00</td>
<td>25.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Brunei</td>
<td>0.04%</td>
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<td>12.70</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.20%</td>
<td>65.30</td>
<td>34.70</td>
<td>0.07</td>
<td>0.00</td>
</tr>
<tr>
<td>Iran</td>
<td>7.60%</td>
<td>63.00</td>
<td>37.00</td>
<td>2.81</td>
<td>7.91</td>
</tr>
<tr>
<td>Iraq</td>
<td>8.10%</td>
<td>63.00</td>
<td>37.00</td>
<td>3.00</td>
<td>8.98</td>
</tr>
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<td>Kazakhstan</td>
<td>4.40%</td>
<td>71.30</td>
<td>28.70</td>
<td>1.26</td>
<td>1.59</td>
</tr>
<tr>
<td>Kuwait</td>
<td>3.30%</td>
<td>81.30</td>
<td>18.70</td>
<td>0.62</td>
<td>0.38</td>
</tr>
<tr>
<td>Mongolia</td>
<td>0.25%</td>
<td>77.50</td>
<td>22.50</td>
<td>0.06</td>
<td>0.00</td>
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<tr>
<td>Malaysia</td>
<td>0.20%</td>
<td>77.50</td>
<td>22.50</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Oman</td>
<td>9.00%</td>
<td>81.50</td>
<td>18.50</td>
<td>1.67</td>
<td>2.77</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.03%</td>
<td>71.80</td>
<td>28.20</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Qatar</td>
<td>0.05%</td>
<td>82.00</td>
<td>18.00</td>
<td>0.01</td>
<td>0.00</td>
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<tr>
<td>Saudi Arabia</td>
<td>19%</td>
<td>80.80</td>
<td>19.20</td>
<td>3.65</td>
<td>13.31</td>
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<tr>
<td>Singapore</td>
<td>0.00%</td>
<td>87.30</td>
<td>12.70</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.22%</td>
<td>66.00</td>
<td>34.00</td>
<td>0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.28%</td>
<td>66.00</td>
<td>34.00</td>
<td>0.10</td>
<td>0.01</td>
</tr>
<tr>
<td>Yemen</td>
<td>0.81%</td>
<td>62.30</td>
<td>37.70</td>
<td>0.31</td>
<td>0.09</td>
</tr>
<tr>
<td>UK</td>
<td>0.14%</td>
<td>76.50</td>
<td>23.50</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Russia</td>
<td>9.30%</td>
<td>69.50</td>
<td>30.50</td>
<td>2.84</td>
<td>8.05</td>
</tr>
<tr>
<td>Canada</td>
<td>0.08%</td>
<td>78.00</td>
<td>22.00</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Cuba</td>
<td>0.03%</td>
<td>66.00</td>
<td>34.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.34%</td>
<td>72.80</td>
<td>27.20</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Australia</td>
<td>0.89%</td>
<td>77.80</td>
<td>22.20</td>
<td>0.20</td>
<td>0.04</td>
</tr>
<tr>
<td>Argentina</td>
<td>0.36%</td>
<td>73.00</td>
<td>27.00</td>
<td>0.10</td>
<td>0.01</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.00%</td>
<td>69.30</td>
<td>30.70</td>
<td>0.61</td>
<td>0.38</td>
</tr>
<tr>
<td>Colombia</td>
<td>2.20%</td>
<td>68.30</td>
<td>31.70</td>
<td>0.70</td>
<td>0.49</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0.16%</td>
<td>67.30</td>
<td>32.70</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Venezuela</td>
<td>4.50%</td>
<td>54.30</td>
<td>45.70</td>
<td>2.06</td>
<td>4.23</td>
</tr>
</tbody>
</table>


Table A13 China’s crude oil source concentration risk in 2013
Table A14 below shows the calculation of the net profits of the publicly-listed subsidiaries of the three major Chinese NOCs between 2009 and 2013:

<table>
<thead>
<tr>
<th>NOC</th>
<th>Net profit (after tax) million RMB</th>
<th>source</th>
<th>Net profit (after tax) million US$</th>
<th>source</th>
</tr>
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<tbody>
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<td>PetroChina 2013</td>
<td>142,274</td>
<td>p6 2013 PetroChina A.R.</td>
<td>$22,561.10</td>
<td>*</td>
</tr>
<tr>
<td>PetroChina 2012</td>
<td>130,620</td>
<td>ditto</td>
<td>$20,658.30</td>
<td>*</td>
</tr>
<tr>
<td>PetroChina 2011</td>
<td>145,959</td>
<td>ditto</td>
<td>$22,143.20</td>
<td>*</td>
</tr>
<tr>
<td>PetroChina 2010</td>
<td>130,792</td>
<td>ditto</td>
<td>$22,087.90</td>
<td>*</td>
</tr>
<tr>
<td>PetroChina 2009</td>
<td>106,539</td>
<td>ditto</td>
<td>$15,659.90</td>
<td>*</td>
</tr>
<tr>
<td>Five-Year Average</td>
<td></td>
<td></td>
<td>$20,614.43</td>
<td>*</td>
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<table>
<thead>
<tr>
<th>NOC</th>
<th>Net profit (after tax) million RMB</th>
<th>source</th>
<th>Net profit (after tax) million US$</th>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinopec Corp. 2013</td>
<td>65,658</td>
<td>p6 2013 Sinopec Corp. A.R.</td>
<td>$10,570.30</td>
<td>*</td>
</tr>
<tr>
<td>Sinopec Corp. 2012</td>
<td>61,022</td>
<td>ditto</td>
<td>$9,783.83</td>
<td>*</td>
</tr>
<tr>
<td>Sinopec Corp. 2011</td>
<td>70,456</td>
<td>ditto</td>
<td>$10,669.70</td>
<td>*</td>
</tr>
<tr>
<td>Sinopec Corp. 2010</td>
<td>68,343</td>
<td>p5 2010 Sinopec Corp. A.R.</td>
<td>$10,011.10</td>
<td>*</td>
</tr>
<tr>
<td>Sinopec Corp. 2009</td>
<td>61,358</td>
<td>ditto</td>
<td>$8,999.94</td>
<td>*</td>
</tr>
<tr>
<td>Five-Year Average</td>
<td></td>
<td></td>
<td>$10,009.18</td>
<td>*</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NOC</th>
<th>Net profit (after tax) million RMB</th>
<th>source</th>
<th>Net profit (after tax) million US$</th>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNOOC Ltd. 2013</td>
<td>56,461</td>
<td>p6 2013 CNOOC Ltd. A.R.</td>
<td>$9,110.30</td>
<td>p6 2013 CNOOC Ltd. A.R.</td>
</tr>
<tr>
<td>CNOOC Ltd. 2012</td>
<td>63,691</td>
<td>ditto</td>
<td>$10,063.40</td>
<td>*</td>
</tr>
<tr>
<td>CNOOC Ltd. 2011</td>
<td>70,260</td>
<td>p9 2011 CNOOC Ltd. A.R.</td>
<td>$10,660.00</td>
<td>*</td>
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<tr>
<td>CNOOC Ltd. 2010</td>
<td>54,099.50</td>
<td>p5 2010 CNOOC Ltd. A.R.</td>
<td>$8,032.40</td>
<td>p5 2010 CNOOC Ltd. A.R.</td>
</tr>
<tr>
<td>CNOOC Ltd. 2009</td>
<td>39,990</td>
<td>p6 2009 CNOOC Ltd. A.R.</td>
<td>$2,799.02</td>
<td>*</td>
</tr>
<tr>
<td>Five-Year Average</td>
<td></td>
<td></td>
<td>$8,732.02</td>
<td>*</td>
</tr>
<tr>
<td>Grand total:</td>
<td></td>
<td></td>
<td>$39,355.68</td>
<td></td>
</tr>
</tbody>
</table>

* all US$ conversion done through https://www.oanda.com/currency/convert/
using 1 January of the year in question for the historical exchange rates.

Table A14 Chinese NOC profitability 2009-2013
Table A15 below shows the calculation of China’s official diplomatic spending between 2009 and 2013:

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget for all diplomatic activities of MFA, PRC (in RMB)</th>
<th>Budget for all diplomatic activities of MFA, PRC (in million USD)</th>
<th>Budget for entire MFA (including housing, education etc.) (in RMB)</th>
<th>Budget for entire MFA (including housing, education etc.) (in million USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>6,341,581,700</td>
<td>$1,005,620</td>
<td>6,331,681,700</td>
<td>$1,009,190</td>
</tr>
<tr>
<td>2012</td>
<td>5,284,659,000</td>
<td>$814,987</td>
<td>5,186,729,800</td>
<td>$918,969</td>
</tr>
<tr>
<td>2011</td>
<td>5,509,206,700</td>
<td>$842,997</td>
<td>5,166,952,400</td>
<td>$922,322</td>
</tr>
<tr>
<td>2010</td>
<td>4,724,631,300</td>
<td>$693,945</td>
<td>4,634,192,900</td>
<td>$800,56</td>
</tr>
<tr>
<td>2009</td>
<td>5,011,249,500</td>
<td>$725,422</td>
<td>4,935,222,900</td>
<td>$804,240</td>
</tr>
</tbody>
</table>

Five-year average: $822.44

Source of all the figures are from MFA official website (in Chinese). Download their budget excel files of the pertinent years all USD conversion done through https://www.xe.com/currencyconverter/ using 1 Jan of the year in question for the historical exchange rates.

GDP, current US$ (2016) in billion $

<table>
<thead>
<tr>
<th>Year</th>
<th>MFA budget as % of Gross GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>9.607</td>
</tr>
<tr>
<td>2012</td>
<td>8.561</td>
</tr>
<tr>
<td>2011</td>
<td>7.573</td>
</tr>
<tr>
<td>2010</td>
<td>6.101</td>
</tr>
<tr>
<td>2009</td>
<td>5.51</td>
</tr>
</tbody>
</table>

Five-year average: 7.904

Gross MFA budget as percentage of GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>3904.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>6.013</td>
</tr>
<tr>
<td>2012</td>
<td>5.915</td>
</tr>
</tbody>
</table>


Budget of MoCOM External Organizations only in RMB (in billion)$

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget of MoCOM External Organizations only in RMB (in billion RMB)</th>
<th>Source</th>
</tr>
</thead>
</table>

5 or 4 - year average of MFA + MoCOM budget relevant to all diplomacy:

| Year | $1,258.62 |

All the sources are from official Ministry of Commerce website. There is an overall category of foreign affairs expenses with three sub-categories in the budget. I am only counting this sub-category which is the biggest and include things like foreign aid and international organization donations and others. Year 2009 information not available on website.

Table A15  China’s Official Diplomatic Spending 2009 to 2013
Appendix D
Oil Supply Securitisation Score Tally

Table A16 below shows distribution of scores of various terms used in the annual reports to securitise oil supply by all the oil companies content analysis have been conducted.

<table>
<thead>
<tr>
<th></th>
<th>Oil Supply Securitisation Score Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>strategic</td>
</tr>
<tr>
<td>PTT 2013</td>
<td>0</td>
</tr>
<tr>
<td>PTT 2012</td>
<td>0</td>
</tr>
<tr>
<td>PTT 2011</td>
<td>0</td>
</tr>
<tr>
<td>PTT 2010</td>
<td>0</td>
</tr>
<tr>
<td>PTT 2009</td>
<td>0</td>
</tr>
<tr>
<td>Thai NOC grand total</td>
<td>0</td>
</tr>
<tr>
<td>Thai NOC 5-yr average</td>
<td>0</td>
</tr>
<tr>
<td>CPC 2013</td>
<td>2</td>
</tr>
<tr>
<td>CPC 2012</td>
<td>2</td>
</tr>
<tr>
<td>CPC 2011</td>
<td>2</td>
</tr>
<tr>
<td>CPC 2010</td>
<td>2</td>
</tr>
<tr>
<td>CPC 2009</td>
<td>2</td>
</tr>
<tr>
<td>Taiwan NOC grand total</td>
<td>10</td>
</tr>
<tr>
<td>Taiwan NOC 5-yr average</td>
<td>2</td>
</tr>
<tr>
<td>ONGC 2013-14</td>
<td>7</td>
</tr>
<tr>
<td>ONGC 2012-13</td>
<td>1</td>
</tr>
<tr>
<td>ONGC 2010-11</td>
<td>0</td>
</tr>
<tr>
<td>ONGC 2008-09</td>
<td>3</td>
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<tr>
<td>ONGC 2007-08</td>
<td>4</td>
</tr>
<tr>
<td>ONGC grand total</td>
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</tr>
<tr>
<td>ONGC 5-yr average</td>
<td>2.8</td>
</tr>
<tr>
<td>IndianOil 2013-14</td>
<td>0</td>
</tr>
<tr>
<td>IndianOil 2012-13</td>
<td>0</td>
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<td>IndianOil 2011-12</td>
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<tr>
<td>IndianOil 2010-11</td>
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<tr>
<td>IndianOil 2009-10</td>
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<td>IndianOil grand total</td>
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<tr>
<td>IndianOil 5-yr average</td>
<td>0</td>
</tr>
<tr>
<td>India Grand total</td>
<td>14</td>
</tr>
<tr>
<td>India 5-yr average</td>
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</tr>
<tr>
<td>Reliance 2013-14</td>
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<tr>
<td>Reliance 2012-13</td>
<td>0</td>
</tr>
<tr>
<td>Reliance 2009-10</td>
<td>0</td>
</tr>
<tr>
<td>Reliance Grand total</td>
<td>0</td>
</tr>
<tr>
<td>Reliance 3-yr average</td>
<td>0</td>
</tr>
<tr>
<td>Sinopec Group 2013 Chinese</td>
<td>4</td>
</tr>
<tr>
<td>Sinopec Group 2012 Chinese</td>
<td>11</td>
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<tr>
<td>2-yr Sinopec Chinese Average</td>
<td>7.50</td>
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<tr>
<td>Sinopec Corp. 2013</td>
<td>4</td>
</tr>
<tr>
<td>Sinopec Corp. 2012</td>
<td>2</td>
</tr>
<tr>
<td>Sinopec Corp. 2011</td>
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</tr>
<tr>
<td>Sinopec Corp. 2010</td>
<td>1</td>
</tr>
<tr>
<td>Sinopec Corp. 2009</td>
<td>1</td>
</tr>
<tr>
<td>5-yr Sinopec English Average</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>strategic</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>CNPC 2012 Chinese</td>
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</tr>
<tr>
<td>CNPC 2011 Chinese</td>
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</tr>
<tr>
<td>2-yr Chinese CNPC AR average</td>
<td>2.50</td>
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<td>PetroChina 2013</td>
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</tr>
<tr>
<td>PetroChina 2012</td>
<td>11</td>
</tr>
<tr>
<td>PetroChina 2011</td>
<td>4</td>
</tr>
<tr>
<td>PetroChina 2010</td>
<td>10</td>
</tr>
<tr>
<td>PetroChina 2009</td>
<td>7</td>
</tr>
<tr>
<td>5-yr PetroChina English AR average</td>
<td>6.00</td>
</tr>
<tr>
<td>CNOOC Ltd. 2013</td>
<td>3</td>
</tr>
<tr>
<td>CNOOC Ltd. 2012</td>
<td>4</td>
</tr>
<tr>
<td>CNOOC Ltd. 2011</td>
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</tr>
<tr>
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<tr>
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<tr>
<td>5-yr CNOOC average</td>
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<td>CNOOC Group 2013 Chinese</td>
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<td>CNOOC Group 2012 Chinese</td>
<td>7</td>
</tr>
<tr>
<td>2yr Chinese CNOOC Group AR average</td>
<td>6.50</td>
</tr>
<tr>
<td>5-yr Chinese NOC En AR average</td>
<td>3.71</td>
</tr>
<tr>
<td>2yr Chinese NOC En AR average</td>
<td>5.50</td>
</tr>
<tr>
<td>Exxon Mobile 2013 Form 10-K</td>
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</tr>
<tr>
<td>Exxon Mobile 2010 summary</td>
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<tr>
<td>Exxon Mobile 2009 summary</td>
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<tr>
<td>Exxon Mobile 3-yr average</td>
<td>0</td>
</tr>
</tbody>
</table>

Table A16  Securitising score tally of oil companies
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