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Signature.....*Lawrence Broz*

Date: **17 May, 2001**

SOVEREIGN CREDIBILITY IN INTERNATIONAL POLITICAL ECONOMY

A thesis presented

by

Alvin Tzy Tien Tan

to

The Department of Government

in partial fulfillment of the requirements

for the degree of

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in the subject of

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Alvin Tzy Tien Tan

"Sovereign Credibility in International Political Economy"

Advisors: Prof. Jeffry Frieden, Prof. J. Lawrence Broz, Prof. Jasjeet Singh Sekhon

DISSERTATION ABSTRACT

My dissertation, titled "Sovereign Credibility in International Political Economy," focuses on analyzing the determinants and effects of sovereign credibility in international political economy. Sovereign credibility is defined as *the belief by outside observers of the ability and willingness of a state to fulfill its promises*. I focus on the willingness aspect of credibility, which I term sovereign behavioral credibility.

The main hypothesis is that sovereign behavioral credibility is a determinant of external perceptions of the riskiness of a given country. I further posit that sovereign behavioral credibility is a function of three attributes: past behavior, democracy, and political instability. The empirical portion of the dissertation is focused on analyzing credibility effects statistically in two issue-areas: sovereign bank debt, and foreign direct investment in the petroleum industry.

Credibility is a critical concern in international relations because the decentralized interaction that occurs among states and entities in the international environment exists within a framework of asymmetric information and lack of third-party enforcement. The resulting problems of trust are endemic to the study of the field. The ability to commit credibly alleviates distrust and furthers mutual cooperation in the anarchy of international relations. Nevertheless, little empirical research has been done on the subject.

My dissertation partly remedies the lack of empirical research on credibility in international relations. The empirical findings in my study support the hypothesis that sovereign behavioral credibility influences perceptions of country risk. Moreover, past behavior and democracy are confirmed statistically to be significant determinants of risk perception.

CONTENTS

INTRODUCTION

This research project aims to make a contribution to the important literature on credibility in international relations. I will first discuss what factors encourage and shape perceptions of sovereign behavioral credibility, and then will attempt to empirically verify the existence of credibility effects in certain issue-areas of international political economy using econometric methods. There has been hitherto little empirical research on the workings and impact of sovereign credibility despite its importance in international relations theory.

The empirical findings lend support to the hypothesis of credibility effects in international relations. Two of the three hypotheses relating to sovereign behavioral credibility are confirmed by the data analysis. The findings are encouraging because empirical verification of behavioral credibility effects has long been elusive. My dissertation sheds new light on sovereign credibility, and solidifies our understanding of it.

The research agenda is twofold. The main aim would be to evaluate the hypothesis that *sovereign behavioral credibility is a determinant of external perceptions about the riskiness of a given country*. In other words, the behavioral credibility of a given country contributes to the risk premium demanded by foreign investors. The second part of the agenda is to determine empirically the variables that influence the level of sovereign behavioral credibility significantly. This project focuses on two specific issue-areas in the empirical case studies: sovereign debt, and foreign direct investment in the petroleum industry. These issue-areas were chosen for several reasons: availability of data for use in econometric modeling; environmental conditions for credibility formation

appear to be satisfied; theoretical existence of credibility effects has been demonstrated; and the focus on international political economy. Data availability is a major consideration as I have chosen a quantitative analytical path for the empirical portion of this research project.

Credibility is the belief by others about one's ability and willingness to fulfill a commitment. The type of commitment highlighted in this study is the promise to cooperate. Thomas Schelling illustrated the meaning of credibility by referring to a character in Joseph Conrad's *The Secret Agent.* In Conrad's tale, the London police left untouched a chemist who supplied a group of anarchists in London with nitroglycerin. When asked why the police did not arrest him, the chemist explained that he kept some nitroglycerin in his jacket pocket ready to blow himself up if the police attempted to apprehend him. He further explained that the means itself was insufficient:

> I have the means to make myself deadly, but that by itself...is absolutely nothing in the way of protection. What is effective is the belief those people have in my will to use the means. That's the impression. It is absolute. Therefore, I am deadly."[1]

The point of the chemist is that the willingness factor in credibility is oftentimes more important than the ability factor.

We observe states making promises and threats constantly, but some states are considered more credible than others. This study analyzes why credibility varies between states in certain issue-areas in international political economy. A country's level of credibility vis-à-vis outside observers is hypothesized to be formed by behavioral and structural factors, and the individual hypotheses on the strength of a given country's credibility will be derived from these factors.

TWO ASPECTS OF CREDIBILITY

Sovereign credibility may be conceived as divided into structural and behavioral aspects of credibility.[2]

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Sovereign credibility = f(structural, behavioral)
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Structural credibility is a function of the material interest and capability to realize the country's commitments. What this means is that a country would be more likely to fulfill a promise that is in harmony with its material interests and within its material capability. The intuition is quite simple, namely that a promise is more credible when it is in the giver's interest and ability to fulfill it.

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Structural credibility = f(material interest, material capability)
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However, ability is not necessarily coterminous with willingness, and behavioral credibility is the belief by others about a country's willingness to fulfill a promise. As Conrad's chemist noted, willingness is oftentimes more important than ability. Behavioral credibility could be thought of as a function of three variables: past behavior; political instability; and degree of democracy. The past relevant behavior of a country has an important impact because it serves as a record of its past actions in similar circumstances, and it is an important signaling mechanism for how the country's partners should treat it. Countries experiencing political instability may be less credible than stable polities in carrying out economic and political policies attractive to foreign investors. They may also be less deterred by the lost of future benefits from cooperation

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[1] Quoted in Thomas C. Schelling, *Arms and Influence* (New Haven, CT: 1966), p. 37.

[2] "The credibility of a deterrent threat depends upon the defender being perceived as possessing (1) military capabilities sufficient to inflict substantial costs on a potential attacker and (2) the will to use those capabilities if necessary." In Paul K. Huth, *Extended Deterrence and the Prevention of War* (New Haven, CN: 1988), p. 4.

if they renege. Furthermore, the promises of democracies may be more credible than that of non-democracies.

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Behavioral credibility = f(past behavior, political stability,
                           democracy)
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This study will concentrate on the behavioral elements of credibility. While the structural elements are undoubtedly important, they have been dealt with effectively in other studies, and the logic behind their posited influence on credibility is very much clearer and more intuitive. In other words, the structural determinants of credibility are straightforward and unproblematic. It is the behavioral elements that remain murky and inadequately studied. More importantly for our purposes, the behavioral factors are much more interesting from a political science perspective.

TWO DIMENSION OF CREDIBLITY

It is often said that international relations exist within a framework of anarchy. There are at least two subtly different formulations of anarchy, and I simply use the more general formulation, namely that anarchy means the "lack of a common government" that can enforce the sanctity of contracts made by states.[3] Countries are free to promise whatever they wish and make commitments at will, but no overarching disinterested third-party exists to punish noncompliance. This unhappy condition is often distinguished from the ideal of domestic governance. International anarchy causes problems with compliance and cooperation, and correspondingly makes them the central concern of

[3] Quoted from Robert Axelrod & Robert O. Keohane, "Achieving Cooperation Under Anarchy: Strategies and Institutions," in Kenneth Oye (ed.), *Cooperation Under Anarchy* (Princeton, NJ: 1986), p. 226. The other formulation of anarchy refers to the ability of states to resort to the use of force for self-help. For a discussion of these two notions of anarchy, see Robert Powell, "Anarchy in International Relations Theory: The Neorealist-Neoliberal Debate," *International Organization* 48 (Spring 1994): pp. 330-34.

international relations scholars. The question of credibility lies at the heart of these concerns, and it is no surprise that credibility is frequently cited by both practitioners and scholars as an important consideration in the realm of international politics. Nevertheless, its significance has not been widely subjected to empirical analysis and verification.

Credibility is fundamentally about trust, and how social activities may be coordinated in the absence of an external enforcement authority. There are two dimensions to any discussions about credibility. The first dimension concerns the environmental conditions that allow credibility to form and sustain cooperation among autonomous rational agents. These "macro" conditions, however, do not determine the level of credibility of a given agent. These environmental conditions promote a milieu of mutual cooperation, but whether or not a given agent is perceived to be a cooperative type is determined largely by other "micro" variables that are agent-specific. This leads to the second dimension of credibility where one is concerned about the variables or factors that actually determine the level of credibility of a particular agent. Although I will discuss both dimensions of credibility in detail, I am more interested in the second dimension because it generates testable hypotheses. The empirical analyses are confined to studying and testing the variables that affect the level of sovereign credibility.

Game theory generates important insights on how certain environmental conditions make it possible for mutual cooperation to exist in settings bereft of an external enforcement authority. The promise of a stream of payoffs from frequent and repeated interaction into the indefinite future provides an incentive for an autonomous agent to cooperate with its partners. Moreover, the record of past behavior of each agent must be available and transparent to the other players in the community. A transparent

record permits each agent to pursue an effective self-policing role against cheaters in anarchic settings. Cheaters are ostracized from the community, and future payoffs from interaction are denied to them. Thus, self-interested behavior within the requisite environmental conditions may indeed encourage trust and dissuade cheating. The outcome is widespread mutual cooperation. In this scenario, the strictures imposed by international anarchy need not induce paralysis on international cooperation.

The right environmental conditions make it possible to sustain mutual cooperation through the credibility mechanism, but they do not determine whether each and every player will indeed follow a cooperative strategy. The level of credibility of each agent is largely determined by agent-specific factors whose values are unique to each of them. Even in an environment of widespread cooperation, there may still be autonomous agents that pursue a non-cooperative strategy for internal reasons. Such agents may be inclined to renege on their commitments because they discount future payoffs from cooperation heavily and have a preference for arbitrary behavior. I believe the level of sovereign behavioral credibility, which is a perception held by outside observers, is influenced by past behavior, domestic political instability and degree of democracy.

CREDIBILITY IN DETERRENCE

Sovereign credibility is highly important in international relations because the decentralized interaction that occurs among states exists within a framework of asymmetric information and lack of third-party enforcement. The resulting problems of communication and trust are endemic to the study of international relations. The post-

Second World War (WWII) international environment presented particular problems to the communication of resolve and threats among great powers.

The invention of nuclear weapons and the new international norm against aggressive war as a tool of foreign policy that arose in the aftermath of WWII changed the nature of international competition. The norm against war and threat of nuclear Armageddon made it difficult for states to convince adversaries that they would unleash large-scale war in the pursuit of their goals. Unwilling and unenthusiastic about initiating war against other nuclear powers, statesmen sought to achieve foreign policy goals vis-à-vis other great powers through pressure and threats. Thus was born a new emphasis on the methodology of making threats credible so that states could achieve their goals without having to resort to the traditional final resort of war.[4]

The earliest systematic analysis of credibility in international relations arose in deterrence scholarship. The literature on deterrence asserts that deterrence only works when the fear of retaliation is credible. To make a commitment credible, a state has to be able *and* willing to undertake what it has promised or threatened. The early works on deterrence focused on reputation as the most important determinant of credibility, and oftentimes at the expense of other important factors. A reputation for firmness was once widely considered as the prime, if not the only, method for communicating credibility in commitments.

In one of the most important early formulation of deterrence theory, William Kaufman stated that effective deterrence requires that the threat of retaliation be surrounded with "an air of credibility." Credibility will in turn be derived from the

country's "past record of performance in comparable contingencies; the statements and behavior of its government; and the attitudes of public opinion, both domestic and allied."[5] Thomas Schelling elevated reputation into the most important factor in forging credibility:

> [T]here is...the more serious kind of "face", the kind that in modern jargon is known as a country's "image", consisting of other countries' beliefs...about how the country can be expected to behave. It relates not to a country's "worth" or "status" or even "honor", but to its reputation for action. If the question is raised whether this kind of "face" is worth fighting over, the answer is that this kind of face is one of the few things worth fighting over. Few parts of the world are intrinsically worth the risk of serious war by themselves, especially when taken slice by slice, but defending them or running risks to protect them may preserve one's commitments to action in other parts of the world and at later times. "Face" is merely the interdependence of a country's commitments; it is a country's reputation for action, the expectations other countries have about its behavior.[6]

The early deterrence literature assumed a binary view of commitment, namely an oversimplification of commitment as an "either-or" condition. A country either committed itself or it did not, and if it did the commitment was unequivocal. Consequently, the literature was primarily concerned with the technique of communicating one's intent credibly to an adversary, largely at the expense of ignoring the intrinsic merits of a situation. It was assumed that observers make general judgments about a state's credibility rather than basing their evaluations on the nature of the specific situation.[7]

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[4] Robert Powell, *Nuclear Deterrence Theory: The Search for Credibility* (NY: 1990), pp. 6-32; Schelling, *Arms and Influence*, p. 18; and Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: 1976), p. 24.

[5] William W. Kaufman, *The Requirements of Deterrence* (Princeton, NJ: 1954).

[6] Schelling, *Arms and Influence*, p. 124

[7] Alexander George & Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: 1974), pp. 64-83, 550-65.

Reputation was perceived as the way for states to overcome the uncertainty among outside observers about a state's resolve, which was private information. The actual resolve or interest of a state in a given situation was not seen as important as the perceived resolve derived from its reputation.[8] American foreign policy during the Cold War was indeed highly concerned with American reputation, and was largely based on the assumption that commitments are interdependent. The American preoccupation with image as the essence of managing deterrence is well observed and documented.[9] Henry Kissinger, for example, defended the policy of securing peace with honor in Vietnam in terms of American reputation:

> Scores of countries and millions of people relied for their security on our willingness to stand by allies, indeed in our confidence in ourselves. No serious policymaker could allow himself to succumb to the fashionable debunking of "prestige," or "honor" or "credibility."...We could not revitalize the Atlantic Alliance if governments were assailed by doubts about American staying power.[10]

The unusual configuration and perception of international politics in the immediate aftermath of the Second World War distorted the development of deterrence theory. The perception of a bipolar and zero-sum conflict against a monolithic Communist bloc seeking world dominion encouraged the early deterrence theorists to homogenize American commitments made to various countries and to assert the "interdependence of commitments." The putative unitary yet global nature of the

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[8] Glenn H. Snyder & Paul Diesing, *Conflict Among Nations: Bargaining, Decision Making, and System Structure in International Crises* (Princeton, NJ: 1977), p. 194; and Powell, *Nuclear Deterrence Theory*, pp. 37, 48.

[9] Patrick M. Morgan, "Saving Face for the Sake of Deterrence," in Robert Jervis, Richard Ned Lebow & Janice Gross Stein (eds.), *Psychology and Deterrence* (Baltimore, MD: 1985), pp. 125-52.

[10] Henry Kissinger, *The White House Years* (Boston, MA: 1979), p. 228.

Communist threat caused fear that behavior in one locale had important repercussions for the entire international system.[11]

Critics of early deterrence theory pointed out that commitments are actually very context-dependent, and the credibility of a particular commitment is determined primarily by the interests directly at stake. "The fact of the matter", according to Alexander George and Richard Smoke, "is that the task of achieving credibility is secondary to and dependent upon the more fundamental questions regarding the nature and valuation of interests."[12] A commitment not in harmony with major interests will not be seen as credible, no matter what the state has said or done in the past. Robert Jervis, for instance, distinguished between intrinsic interest, strategic interest, and commitment, whereby a commitment is only to be taken for granted when the first circumstance is involved.[13]

More recent scholarship has restored balance to the question of credibility in deterrence by identifying other important elements, namely the national interest at stake, the material capability to fulfill a commitment, the cost and risk associated with upholding a commitment, and the domestic political dynamic driving policy-making.[14]

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[11] Max Singer & Aaron Wildavsky, "A Third World Averaging Strategy," in Paul Seabury & Aaron Wildavsky (eds.), *U.S. Foreign Policy: Perspectives and Proposals for the 1970's* (NY: 1969), pp.

[12] George & Smoke, *Deterrence in American Foreign Policy*, p. 559. See also Stephen Maxwell, "Rationality in Deterrence," Adelphi Paper #50 (August 1968).

[13] Robert Jervis, "Deterrence Theory Revisited," *World Politics* 31 (January 1979): pp. 314-20. There are other criticisms of deterrence theory based on psychology. Correct perception of signals from adversaries depends on a common frame of reference. Signals from adversaries in the real world are frequently missed or misinterpreted. Statesmen also tend to rationalize their goals as attainable, and expect their adversaries to accommodate them. Consequently, deterrence may fail due to the cognitive limitations of policy makers. See Snyder & Diesing, *Conflict Among Nations*, pp. 310-39; and Richard Ned Lebow, "Conclusions," in Jervis, Lebow & Stein, *Psychology and Deterrence*, pp. 203-17

[14] "Instead of...emphasizing the critical importance of credibility and signaling to deterrence strategy, theorists would do better to caution that sophisticated opponents will judge credibility on the basis of a more fundamental analysis of the defender's interests. For this purpose, the opponent is likely to pay more attention to strategic, political, economic, and ideological factors determining the nature and magnitude of those interests than to rhetorical and other signaling devices the defending power may employ to enhance credibility." In George & Smoke, *Deterrence in American Foreign Policy*, p.p. 560-61.

Some scholars have also advanced the idea that the nature of domestic political institutions may have a significant impact on the credibility of commitments.

The state whose leadership is more sensitive to "audience costs" is less likely to back down in an international crisis that engages the state's national honor. Democracies are better able to generate large audience costs than non-democracies because the population of the former can penalize their leaders more easily. Making concessions in an international crisis is seen by the domestic audience as a sign of incompetence, and triggers a desire among the audience to remove a leader who backs down. Naturally, no political leader desires to be evicted from office, so leaders in democracies will be more resistant to yielding in an international crisis. Therefore, the resolve of democracies in the face of international crises is more credible than that of non-democracies.[15] It is interesting to note that the concern with the domestic determinants of credibility is a return to one of Kaufman's early points about the significance of domestic public opinion. Another field in international relations strongly concerned about credibility is liberal institutionalism.

CREDIBILITY IN INSTITUTIONALISM

Whereas deterrence theorists are concerned with communicating threats, institutionalists seek to promote cooperation among states. The institutionalist literature is concerned with the role that institutions and regimes play in mitigating the effects of international anarchy, and draws heavily from insights gleaned from game theory. The

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[15] See James D. Fearon, "Domestic Political Audiences and the Escalation of International Disputes," *American Political Science Review* 88 (September 1994): pp. 577-92; James D. Fearon, "Signaling Foreign Policy Interests: Tying Hands Versus Sinking Costs," *Journal of Conflict Resolution* 41 (February 1997):

asymmetric information and lack of third-party enforcement in international relations lead to Pareto-suboptimal outcomes. The classic example of such a situation is the "dilemma of common interests," typically exemplified by the Prisoners' Dilemma game, where the mutually preferred outcome is neither individually accessible nor stable. Agents must actively cooperate against choosing the individually dominant strategy in order to arrive at the mutually preferred outcome. Therefore, cooperation among states entails coordination of their activities and policies to facilitate the attainment of mutual goals and desired outcomes. Credibility plays an essential role in this regard because it makes coordination possible. If no country had any faith in the commitments made by other countries, then there would be no international cooperation.[16]

To understand the core concepts of institutionalism, it is useful to consider John Mearsheimer's definition of international institutions:

> [A] set of rules that stipulate the ways in which states should cooperate and compete with each other. They prescribe acceptable forms of state behavior, and proscribe unacceptable kinds of behavior. These rules are negotiated by states, and according to many prominent theorists, they entail the mutual acceptance of higher norms, which are "standards of behavior defined in terms of rights and obligations."[17]

Another well-known formulation of institutions defined them "as sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations."[18] Thus, institutions

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pp. 69; and Alastair Smith, "International Crises and Domestic Politics," *American Political Science Review* 92 (September 1998), pp. 623-38.

[16] Arthur A. Stein, "Coordination and Collaboration: Regimes in an Anarchic World," in Stephen D. Krasner (ed.), *International Regimes* (Ithaca, NY: 1983), pp. 120-24; and Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton, NJ: 1984), pp. 51-5.

[17] Although Mearsheimer may be a prominent skeptic of institutionalism, his definition of institutions as understood by institutionalists is accurate and apt.
John J. Mearsheimer, "The False Promise of International Institutions," *International Security* 19 (Winter 1994/95): p. 8.

[18] Stephen D. Krasner, "Structural Causes and Regime Consequences: Regimes as Intervening Variables," in Krasner, *International Regimes*, p. 2.

facilitate the convergence of expectations largely by encouraging the measurement and observation of a given country's behavior, and comparing it against accepted benchmarks. This process drives considerations of credibility.

Much of early institutionalist scholarship was devoted to demonstrating that successful coordination to resolve dilemmas of common interests requires strict rules elaborating clearly what constitutes cooperation and cheating. Institutions designed to encourage cooperation must also be able to detect cheating quickly and disseminate that information to other states. This discourages cheating because cheaters will jeopardize future cooperative efforts and their potential victims will receive early warning. Thus, institutions that deal with collective action problems overcome them by creating a monitoring system against cheating. The implication is that international cooperation requires transparency and the free-flow of information.[19]

Governments join international institutions because they allow governments to commit credibly to future cooperative acts and help them gather information about other states, and thereby break the dilemma of common interests. Institutions prescribe a common benchmark of behavior against which countries are judged. A state that violates her institutional commitments damages "not only a mutually beneficial set of arrangements but also the violator's reputation, and thus her ability to make future agreements."[20] Even in the absence of specific regime rules and procedures, states would think twice before breaking prevailing general principles and norms because such behavior brands them as untrustworthy, and makes it extremely difficult for them to

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[19] See Kenneth A. Oye, "Explaining Cooperation Under Anarchy: Hypotheses and Strategies," in Kenneth A. Oye (ed.), *Cooperation Under Anarchy* (Princeton, NJ: 1986), pp. 1-24; and Keohane, *After Hegemony*, Chp. 6.

[20] Keohane, *After Hegemony*, p. 126.

obtain cooperative behavior from other states in the future. Information helps outside observers evaluate more accurately whether a country is able and willing to keep its commitments. Most importantly, cooperative behavior is encouraged not by violence or coercion, but through social punishments: withholding favors, future cooperation and friendship.

International institutions, in this framework, work their magic by allowing reciprocity to operate efficiently. Reciprocity is facilitated through the provision of information about another country's preferences and behavior, and setting standards. Institutions also lower the transaction cost of reaching and maintaining agreements among states, plus providing dispute–resolution functions. Good conduct is rewarded with future gains from future cooperation, while bad conduct is punished with ostracism.[21]

In game theoretic terms, international institutions publicize a country's behavioral record, illuminate its payoffs, and offer the promise of frequent and repeated interaction. A record of past behavior informs potential partners how a country has acted in the past, and how they should act towards it in the present. Monitoring warns others when a country has broken its commitments, so that they may take appropriate action to protect themselves quickly, and provides a transparent record of the violator's transgression for future reference. Transparent payoffs make it easier to predict how a country will act in a particular situation. It is important to note that frequent and repeated interaction is essential to credibility formation. Institutions are viewed as an alternative to third-party enforcement. They create a self-policing milieu where repeated interaction is encouraged

[21] Robert O. Keohane, "Reciprocity in International Relations," *International Organization* 20 (Winter 1986): pp. 1-27.

and agents are stripped of anonymity. Repeated interaction with transparency generates credibility, and greater credibility ultimately contributes to greater cooperation. The following chapter discusses in greater detail how these conditions sustain mutual cooperation in an anarchic environment.

In recent years, we have learned that there are other forms of dilemmas inhibiting cooperation among states. The dilemma of common aversions, for example, is caused not by fear of cheating, but by conflict over the distribution of gains.[22] Nevertheless, the insight that institutions help mitigate collective action problems remains an important contribution of the institutionalist literature.

One of the most important current trends in institutionalist scholarship is in demonstrating how institutions matter. More research is required to understand the circumstances under which institutions produce their virtuous effects. This obviously requires a deeper understanding of the underlying conditions that facilitate or obstruct the influence of international institutions on state behavior.[23] Credibility is the most important of those conditions, as cooperation would not be possible without it.

The deterrence and institutionalist literatures focus on different vehicles for projecting credibility. States in the deterrence world largely attempt to communicate credibility directly through their actions and statements. On the other hand, liberal institutionalists delve into how an intervening international institution may create an environment of structured interaction that fosters credibility, and hence cooperation among states. Nevertheless, both recognize that communication among actors in an

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[22] See Stephen D. Krasner, "Global Communications and National Power: Life on the Pareto Frontier," *World Politics* 43 (April 1991): pp. 336-66.

anarchic setting is fraught with difficulties. Consequently, the ability of states to overcome the problems of belief and trust endemic to international relations is all the more remarkable, and important to understand.

It is surprising how little empirical research has been done on a subject so widely cited for its putative virtues. Credibility has been much evoked as a support for this or that theory, but it has rarely been analyzed directly. What little empirical results that have been found on the subject of credibility are inconclusive. The sad conclusion by a noted scholar that there is virtually no solid theoretical or empirical underpinning of what constitutes credibility in international relations still holds after nearly two decades.[24]

RESEARCH OUTLINE

What conditions produce a credibility mechanism that supports mutual cooperation? Do observers evaluate and care about the credibility of states, as posited by theory? If yes, what variables account for varying levels of sovereign behavioral credibility? These are the questions I will discuss and examine through the next seven chapters. They are questions about how autonomous rational agents lacking the supervision of an external enforcement authority may nourish mutual cooperation through their own self-interested efforts.

The following chapter is a game theoretic discussion of the environmental conditions that encourage cooperative outcomes in anarchic settings: frequent and repeated interaction into the indefinite future, and transparent record of past behavior.

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[23] Liliana Botcheva & Lisa L. Martin, "Institutional Effects of State Behavior: Typologies and Hypotheses," Weatherhead Center for International Affairs Working Paper #99-05 (Cambridge, MA: 1999), pp. 4-6.

These two background conditions give rise to a credibility mechanism that dissuades cheating and promotes cooperation when coupled with self-policing behavior by the autonomous agents. The third chapter then discusses the variables that affect the level of behavioral credibility of a given country, and the testable hypotheses associated with them. The three variables posited to influence behavioral credibility – past behavior, political instability, and degree of democracy - are discussed in detail. These variables influence behavioral credibility by eliciting reactions from other agents, and by influencing the discount rate and payoffs faced by a country.

The fourth chapter is devoted to a theoretical and historical discussion of sovereign bank debt. A presentation of the empirical findings in the sovereign debt issue-area is the focus of the fifth chapter. Foreign direct investment in petroleum is another area of interest, and chapter six considers the concerns in this issue-area with regard to sovereign credibility. The corresponding empirical findings are presented and discussed in the seventh chapter. The final chapter discusses the inferences concerning credibility gleaned from the theoretical discussion and empirical findings presented in the earlier chapters. It concludes this research project.

Although the structural factors of credibility are important and constitute half of the theoretical model, I ignore their qualitative contribution to credibility in this study. The behavioral credibility is the object of this study. I chose such a strategy partly for reasons of convenience, and partly because structural credibility has been dealt with comprehensively in other studies. Moreover, behavioral credibility is more interesting politically. Panel data methods are the econometric methodology of choice.

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[24] Robert Jervis, "Deterrence and Perception," in Steven E. Miller (ed.), *Strategy and Nuclear Deterrence* (Princeton, NJ: 1984), pp. 62-3.

CONCLUSION

Credibility is a highly important issue in international relations. The anarchic setting of international politics presents special challenges in understanding and encouraging mutual cooperation. Nevertheless, cooperation can exist in the absence of third-party enforcement through the workings of the credibility mechanism. When the credibility of commitments is enhanced, cooperative outcomes become easier to maintain and the limitations of anarchy are broken.

It is no surprise that credibility has long been a concern in international relations scholarship. The deterrence literature relies critically on assumptions about sovereign credibility. It is also one of the most important mechanisms through which international institutions are said to exert their virtuous effect on international relations. What is surprising is that empirical examinations of credibility have long been neglected.

This study increases our understanding of sovereign credibility in international relations. Although the study concentrates on issue-areas within international political economy, it tackles a subject that is widely important to the entire field of international relations. Credibility concerns lies at the very heart of diplomacy and international relations scholarship. The effects and determinants of sovereign credibility emerge clearer from this endeavor.

ENVIRONMENTAL CONDITIONS FOR CREDIBILITY FORMATION

The idea that an overarching external authority is needed to enforce contracts, and peace in general, among autonomous rational agents remains one of the central pillars of modern liberal thought. The existence of a sovereign, according to the famous assertion by Thomas Hobbes, delivers human beings from an existence that is "solitary, poor, nasty, brutish, and short." Institutionalized protection of property rights is said to be a major contributor to domestic economic growth and prosperity. Other than the government, domestic social networks and norms also play a role in safeguarding property rights through an informal institutional framework.[1]

The Hobbesian imagery of a "war of all against all" has long been used by realist scholars to differentiate domestic society from international anarchy.[2] Cooperative behavior would indeed arise more effortlessly where there is a reliable external authority

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[1] The following quote from Douglass North provides a useful summary of the theory concerning the institutional foundations of economic growth:

> We have only to contrast the organisation of production in a Third World economy with that of an advanced industrial economy to be impressed by the consequences of poorly defined and/or ineffective property rights. Not only will the institutional framework result in high costs of transacting in the former, but insecure property rights will result in using technologies that employ little capital and do not entail long-term agreements. ... Moreover, such mundane problems as the inability to get spare parts or a two-year wait to get a telephone installed will necessitate a different organisation of production than an advanced country requires. A bribe sufficient to get quick delivery through the maze of import controls or get rapid telephone installation may exist; but the resultant shadow transactions costs significantly alter relative prices and consequently the technology employed.

In Douglass C. North, *Institutions, Institutional Change and Economic Performance* (NY: 1990), p. 65. Also see Paul A. David, "Why Are Institutions the 'Carriers of History'?: Path Dependence and the Evolution of Conventions, Organizations and Institutions," *Structural Change and Economic Dynamics* 5 (December 1994): pp. 205–220; Robert D. Putnam, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton, NJ: 1993); and Robert J. Barro, "Democracy and Growth," *Journal of Economic Growth* 1 (March 1996): pp. 1–27.

[2] "Hereby it is manifest that during the time men live without a common power to keep them all in awe, they are in that condition which is called war, and such a war as is of every man against every man....[T]he nature of war consisteth not in actual fighting, but in the known disposition thereto during all the time there

ready to enforce commitments, but cooperation is eminently possible in anarchic settings. The handicap caused by the lack of a global sovereign to protect the sanctity of international contracts and property rights may be overcome when certain background conditions exist. These conditions help explain why autonomous rational agents would keep their promises in the absence of constables and courts.

Other than the lack of a global sovereign to protect international contracts and property rights, there is the added problem of time inconsistency in many cases. Time inconsistency occurs when one party receives the fruits of cooperation immediately while the other has to depend on the continuing good graces of the former in order to acquire the benefits of cooperation over time. With both sovereign debt and FDI, the benefits promised to foreigners are largely to be realized later in the future, but much of the benefits to the host country are obtained almost immediately. Upon receiving the financial investment, the host country will be beset by strong incentives to renege. Time inconsistency alters the incentive structure of the host country, and places pressure on mutual cooperation.

This chapter explores the environmental conditions that support credibility effects in a community of autonomous rational agents, and I will draw deeply from game theory throughout this exploration. The conclusion is that good conduct may be elicited from rational and self-interested agents without the need for third-party enforcement. Cheating is dissuaded and trust is enhanced where the requisite environmental conditions exist, and self-policing behavior is pursued by the individual agents.

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is no assurance to the contrary. All other time is Peace." (Leviathan I, xiii, 8) In Thomas Hobbes, *Leviathan*, edited by Edwin Curley (Indianapolis, IN: 1994), p. 76.

Threats to punish defection are an important way to maintain cooperation, but those threats must be credible. One of the background environmental conditions that give rise to the credibility mechanism is frequent and repeated interaction into the indefinite future. This is not a new insight, and Adam Smith made just such an observation over two centuries ago:

> When a person makes perhaps twenty contracts in a day, he cannot gain so much by endeavoring to impose on his neighbors, as the very appearance of a cheat would make him lose. Where people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does their character....Wherever dealings are frequent, a man does not expect to gain so much by any one contract as by probity and punctuality in the whole, and a prudent dealer, who is sensible of his real interest, would rather chuse to lose what he has a right to than give any ground for suspicion.[3]

Another important condition implicit in Smith's remarks is that the agents are aware of the past behavior of their potential business partners. The idea that frequent and repeated interaction and transparent behavioral records encourage cooperative outcomes has been strongly confirmed by research in game theory.

TWO-STAGE REPEATED GAMES

I am interested in whether threats and promises concerning future behavior can have an impact on current behavior. To help illustrate the mechanism that promotes cooperation through repeated behavior, I start with two-period games of perfect and complete information. Given the Prisoners' Dilemma (PD) game in Figure 1.1, suppose two players play this game twice, observing the outcome of the first play before the

[3] Adam Smith, *Lectures on Jurisprudence*, edited by R. L. Meek, D. D. Raphael & P. G. Stein (NY: 1978), pp. 538-39.

second play begins. I also assume that the payoff for the entire game is simply the sum of the payoffs from the two stages. However, the unique equilibrium of the second-stage game would be (D1,D2) regardless of the outcome of the first-stage game. Taking into account that the payoff of the second-stage is always (2,2), the two-stage Prisoners' Dilemma amounts to the one-stage game in Figure 1.2 where the payoff of the second-stage (2,2) has been added to each first-stage payoff pair. The Figure 1.2 game has the unique Nash equilibrium of (D1,D2), which precludes cooperation and is the same equilibrium as the single period game.

		Player 2	
		D2	C2
Player 1	D1	2,2	6,1
	C1	1,6	4,4

Figure 1.1

		Player 2	
		D2	C2
Player 1	D1	4,4	8,3
	C1	3,8	6,6

Figure 1.2

I now add an additional Nash equilibrium to the two-period game, as illustrated in Figure 2.1. The strategies labeled M_i have been appended to the game, so there are now two pure-strategy Nash equilibria in the first-stage game: (D1,D2) and (M1,M2). Again suppose that the stage game in Figure 2.1 is played twice, with the first-stage outcome observed before the second stage is played. The multiple Nash equilibria allow the players to anticipate that different first-stage outcomes will be followed by different stage game equilibria after the second stage is played. Further assume that the players anticipate that (M1,M2) will be the second-stage outcome if the first-stage outcome is (C1,C2), but that (D1,D2) will be the second-stage result if any of the eight other first-stage outcomes are realized. Like the case above, the two-stage game under this condition amounts to the one-stage game in Figure 2.2, where (5,5) has been added to the (C1,C2) payoff pair and (2,2) has been added to the eight other cells.

		Player 2		
		D2	C2	M1
Player 1	D1	<u>2,2</u>	6,1	0,0
	C1	1,6	4,4	0,0
	M1	0,0	0,0	<u>5,5</u>

Figure 2.1

		Player 2		
		D2	C2	M1
Player 1	D1	4,4	8,3	2,2
	C1	3,8	9,9	2,2
	M1	2,2	2,2	7,7

Figure 2.2

The game in Figure 2.2 has three pure-strategy Nash equilibria: (D1,D2), (C1,C2), and (M1,M2), which correspond to the subgame-perfect outcomes of the original two-stage game in Figure 2.1. The Nash equilibrium (D1,D2) in Figure 2.2 follows the subgame-perfect outcome ((D1,D2),(D1,D2)) in the repeated game. The Nash equilibrium (M1,M2) in Figure 2.2 similarly corresponds to the subgame-perfect outcome ((M1,M2),(D1,D2)) in the repeated game. The equilibrium of (C1,C2) is qualitatively different because it corresponds to the subgame-perfect outcome ((C1,C2),(M1,M2)), and it demonstrates that cooperation can be achieved in the first stage of a subgame-perfect outcome of the repeated game. The more general point to draw from this example is that in a static game of complete information with multiple Nash equilibria, there may be subgame-perfect outcomes of the repeated game G(T) in which, for any $t < T$, the outcome in stage t is not a Nash equilibrium of G.[4]

A more important qualitative point for my purposes is that *credible threats or promises about future behavior can influence current behavior.* Unfortunately, rational

players in the situation as presented above may simply decide to renegotiate upon arriving at the second stage of the game in Figure 2.1. I assumed that the players will follow the original premise by playing (M1,M2) in the second-stage only if the first-stage outcome is (C1,C2), and that (D1,D2) will be the second-stage outcome for any other first-stage outcomes. The players may very well be tempted to play (M1,M2) in the second-stage regardless of the result of the first-stage game because (M1,M2) is a Nash equilibrium with higher payoffs than (D1,D2). Once the players have entered the second period of the game, each player has an incentive to prefer (M1,M2). If (M1,M2) is to be the definite second-stage outcome, however, then the game amounts to the one-stage game in Figure 2.3 where the payoff (5,5) is simply added to each cell of the Figure 2.1 game. In Figure 2.3, we see that the incentive to play (C1,C2) has dissolved as D_i is each player's best response to C_i.

		Player 2		
		D2	C2	M1
Player 1	D1	<u>7,7</u>	11,6	5,5
	C1	6,11	9,9	5,5
	M1	5,5	5,5	<u>10,10</u>

Figure 2.3

[4] See Robert Gibbons, *Game Theory for Applied Economists* (Princeton, NJ: 1992), pp. 82-8.

INFINITELY REPEATED GAMES

The credibility of threats or promises is strengthened in infinitely repeated games. Given a sufficiently long shadow of the future and the promise of repeated interaction, cooperative outcomes are eminently possible.[5] *The key to cooperative outcomes in repeated games is the lure of frequent future interaction without a specific endpoint.* Cooperation is not possible if the players know that the game would end after a particular round. Using the PD as an example, if it were known that the game would end at the 100^{th} round, neither player would have any incentive to play C_i at that round because a cooperative move would not induce any future cooperation from the other player (as there are no more rounds). So (D1,D2) would be the outcome of the 100^{th} round regardless of the history of prior outcomes. Knowing this, the players would also refuse to cooperate in the 99^{th} round because it would have no effect on the outcome of the next or 100^{th} round. Using backwards induction, it is straightforward to verify that the unique sequential-equilibrium scenario is to play (D1,D2) at every round. Cooperation is unraveled by the knowledge that the iteration of the interaction has a specific endpoint.[6]

I now explore the conditions under which cooperation may be sustained as a Nash equilibrium in infinitely repeated games. In the two period PD above, we saw that if there are multiple Nash equilibria of the stage game G then there may be subgame-perfect outcomes of the repeated game G(T) in which, for any $t < T$, the outcome of stage t is not a Nash equilibrium of G. A more robust result is true in infinitely repeated games whereby even if the stage game has a unique Nash equilibrium, there may be subgame-

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[5] See Robert Axelrod, *The Evolution of Cooperation* (NY: 1984), chps. 7 & 9.

perfect outcomes of the infinitely repeated game in which no stage's outcome is a Nash equilibrium.[7]

I again consider the PD but repeated infinitely where for each stage *t*, the outcomes of the *t-1* preceding plays are observed before the *t*th stage begins. Instead of summing the payoffs from each stage, a player's payoff in an infinitely repeated game is better measured by the present value of the chain of payoffs received. The discount factor is given by $\delta = 1/(1+r)$, and the present value of the infinite sequence of payoffs $\pi_1, \pi_2, \pi_3, \ldots$ is

$$\pi_1 + \delta \cdot \pi_2 + \delta^2 \cdot \pi_3 + \ldots = \sum_{t=1}^{\infty} \delta^{t-1} \pi_t$$

The discount factor δ is a measure of the long-term perspective of the players. A δ that is close to 0 means that the players are mainly concerned about their immediate and near-future payoffs. If δ is very close to 1, then the players are not significantly less concerned about their payoffs in any given future round than about their payoffs in the current round.

The unique Nash equilibrium of the PD stage game is noncooperation or (C1,C2). The above analysis of the two-stage PD shows that the players could be induced to cooperate today through the lure of playing a high-payoff equilibrium tomorrow. In the case of the infinitely-repeated game, the payoff from continuous cooperation into the distant future plays a role analogous to the high-payoff equilibrium that was artificially added to the stage game.

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[6] Roger B. Myerson, *Game Theory: Analysis of Conflict* (Cambridge, MA: 1997), pp. 309-10.
[7] See Gibbons, *Game Theory*, pp. 88-93.

		Player 2	
		D2	C2
Player 1	D1	2,2	6,1
	C1	1,6	4,4

Figure 3.1

Using the PD depicted in Figure 3.1, suppose player *i* pursues the celebrated *tit-for-tat* strategy whereby he starts the game by cooperating and reciprocates his partner's last move in every round thereafter. *Tit-for-tat* is a powerful and robust strategy used to enforce cooperation because it is straightforward and easily recognizable by the other player. While player 1 pursues *tit-for-tat*, player 2 has to decide whether to defect or cooperate in the first stage. If player 2 decides to defect at the first round and return to cooperating thereafter, his payoff stream is

$$6+1\cdot\delta+4\cdot\delta^2+4\cdot\delta^3+\ldots$$

On the other hand, player 2 could also follow the *tit-for-tat* strategy and start the game by cooperating. In that case, his payoff stream becomes

$$4+4\cdot\delta+4\cdot\delta^2+4\cdot\delta^3+\ldots=\frac{4}{(1-\delta)}$$

The *tit-for-tat* strategy is optimal if and only if

$$6+\delta\leq 4+4\delta$$

which is true when $\delta\geq 2/3$. The intuition behind this result is that when both players are supposed to choose C_i in equilibrium, player 1 can deter player 2 from choosing D_i only

if the former has a credible threat of some punishment that would impose a greater cost over time on player 2 than he could gain by defecting now. As the discount factor becomes smaller, however, punishments in the future lose their sting and matter less than immediate gains, so it becomes harder to deter player 2.

Another defection strategy that player 2 might pursue is to defect and continue to defect thereafter. If player 2 plays D1, he will obtain a payoff of 6 this stage, but will trigger noncooperation by player 1. The payoff in every future stage is 2 as player 2 defects endlessly. The present value of this stream of payoffs is

$$6+2\cdot\delta+2\cdot\delta^2+\ldots=6+\frac{2\delta}{(1-\delta)}$$

Consequently, cooperation is optimal if and only if

$$\frac{4}{(1-\delta)}\geq 6+\frac{2\delta}{(1-\delta)}$$

where $\delta\geq 1/2$. If *tit-for-tat* is optimal to either of these two extreme defection strategies, then it is optimal for all other strategies that deviate from *tit-for-tat*. In general, *tit-for-tat* is a Nash equilibrium with itself when the actual discount factor is equal to or larger than the bigger required δ for either of the two defection strategies discussed above.[8]

A strategy that is more forceful at sustaining cooperation is the *trigger strategy* or *grim strategy* whereby player *i* starts the game by cooperating and continues to cooperate until his partner fails to cooperate, which triggers a switch to noncooperation thereafter. If δ is close enough to one, then it is a best response for player *j* to adopt the trigger strategy too, and the result will be cooperation in every period. Suppose player 1 adopts the trigger strategy and starts the game by cooperating, but player 2 reciprocates by

[8] See James D. Morrow, *Game Theory for Political Scientists* (Princeton, NJ: 1994), pp. 262-68.

defecting at the first round. Since player 1 will play D1 forever once one stage's outcome differs from (C1,C2), player 2's best response is also to play D2 forever after his defection. The present value of the stream of payoffs accruing to player 2 in this scenario is the same as the one resulting from the second defection strategy from *tit-for-tat* above, as are the optimality conditions for cooperation. Cooperation is optimal in the face of the *trigger strategy* if and only if $\delta \geq 1/2$.

In this case, in the first stage and in any stage such that all the preceding outcomes have been (C1,C2), the optimal action for player 2 given that player 1 is using the *trigger strategy* is C2 if and only if $\delta \geq 1/2$. Moreover, as player 2 should play D2 forever as the best response to a stage's outcome being different from (C1,C2), then there is a Nash equilibrium for both players to cooperate if and only if $\delta \geq 1/2$. Notice that the *trigger strategy* can induce cooperation against defection strategies where the *tit-for-tat* is ineffective, which in this case is when $1/2 \leq \delta \leq 2/3$. It turns out that such a Nash equilibrium is also subgame-perfect, unlike *tit-for-tat*, which means that the players' strategies constitute a Nash equilibrium in every subgame. The two classes of subgames of the *trigger strategy* infinitely-repeated PD are: (A) where all the outcomes of earlier rounds have been (C1,C2); and (B) where the outcome of at least one earlier round differs from (C1,C2). If both players are using the *trigger strategy* for the game as a whole, then the players' strategies in a subgame of class (A) are also the *trigger strategy*, which we have shown is a Nash equilibrium of the game as a whole when $\delta \geq 1/2$. The players' strategies in a subgame of class (B), however, are to repeat the stage-game equilibrium of

(D1,D2) forever, which is also a Nash equilibrium of the game as a whole. Thus, the *trigger strategy* Nash equilibrium of the infinitely repeated PD is subgame-perfect.[9]

Cooperative equilibria appear to involve a kind of reciprocal linkage where the players pledge to do tomorrow what their partners did today. Moreover, the threat of punishment and promise of reward create a situation where it is in the individual player's own interest to pursue good conduct. Cooperation is realized when commitments to pursue good behavior are credible. A long shadow of the future increases the credibility of commitments, as do higher payoffs to cooperation. When trust is strengthened, cooperative outcomes become more likely.

Cooperative outcomes have been shown to hold for virtually all repeated games, regardless of the number of strategies available, the size of the player pool, or the magnitudes of the payoffs.[10] More importantly, cooperative outcomes resulting from repeated interaction are not confined to pre-selected and unchanging game partners. Cooperative outcomes will emerge even when partners change frequently so long as the past actions of a player is common knowledge among all current and potential players. Information about the past behavior of a player is more effortlessly diffused among the community of players if actions are easy to observe, and the player population is small in size and homogenous. Well-informed members of the player population could then punish those who have violated community norms of honesty.[11]

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[9] Gibbons, *Game Theory*, pp. 92-96; and Morrow, *Game Theory*, pp. 264-65.
[10] Drew Fudenberg & Eric Maskin, "The Folk Theorem in Repeated Games with Discounting or with Incomplete Information," *Econometrica* 54 (May 1986): pp. 533-54.
[11] Paul R. Milgrom, Douglass C. North & Barry R. Weingast, "The Role of Institutions in the Revival of Trade: The Law Merchant, Private Judges, and the Champagne Fairs," *Economic and Politics* 2 (March 1990): pp. 1-23.

AN ASYMMETRIC PAYOFF INFINITELY REPEATED GAME

The PD set-up is popular in international relations scholarship, but it may not be accurate as a description of many forms of strategic interaction in international affairs. The PD is symmetric in that both players are equally wary of being cheated by the other. This symmetry, however, is not found in the two issue-areas that I am examining. One of the players, namely the foreign investor, is vulnerable to cheating while the other player, which is the sovereign state, is not as vulnerable. This is especially true in the context of this research project as I am exclusively concerned with the viewpoint and actions of the foreign investor. Therefore, the PD may not be the best representation of the interaction that occurs in the issue-areas of interest in this study. So I turn to a different game to model behavior more accurately. The *extensive form* of the game is depicted in Figure 4.1.[12]

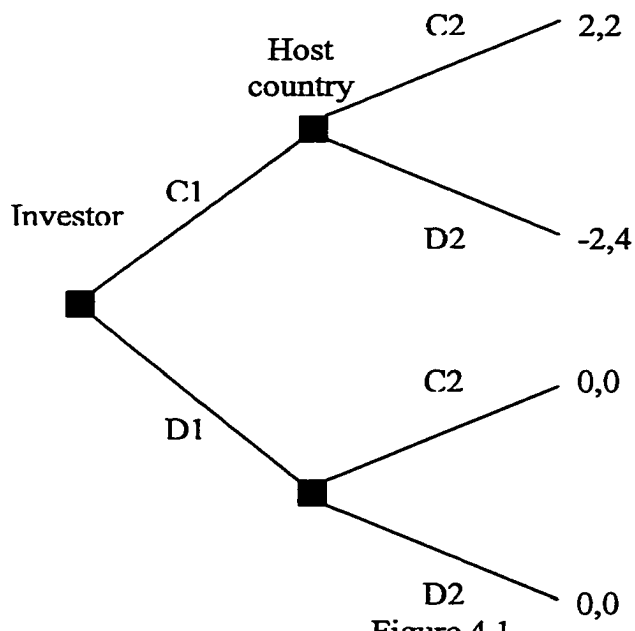

Figure 4.1

Note that the host country makes a move only after the investor has acted. In the case of sovereign debt, both parties benefit (C1,C2) if the investor agrees to lend money and the host country later repays the debt. Unfortunately, if the game is played only once, then the host country's best response to an investment would be to renege (C1,D2) because 4 > 2. The bank would foresee this scenario, and no loan would be made as 0 > -2. The payoffs would then be zero for both parties ((D1,C2) & (D1,D2)).

The reduced *normal representation* of the game above is shown in Figure 4.2. Although the players do not move simultaneously, the virtue of the normal representation is that the strategic decisions of the players are presented independently and simultaneously. It may be plausibly assumed that all players formulate their strategies simultaneously at the beginning of the game once the structure of the game is known.

		Host country	
		D2	C2
Investor	D1	0,0	0,0
	C1	-2,4	2,2

Figure 4.2

[12] The game used here follows the one introduced in Daniel B. Klein, "Promise Keeping in the Great Society: A Model of Credit Information Sharing," in Daniel B. Klein (ed.), *Reputation: Studies in the Voluntary Elicitation of Good Conduct* (Ann Arbor, MI: 1997): pp. 267-87.

Observe that the game in Figure 4.2 has no pure strategy equilibrium, but mutual cooperation is possible if the game were repeated infinitely. I first need to impose several behavioral assumptions on both investors and host countries to simplify the analysis. Behavioral assumption on Investors: Given some aggregate host country behavior, the investor invests if the expected single-period outcome from making an investment is zero or greater. Behavioral assumptions on Host Countries: (A) Each host country acts as if each investor were investing in every noncheating host country; and (B) host countries do not make their strategies investor-specific.[13]

Suppose that investors pursue a *trigger strategy* where noncooperation is triggered whenever a host country defects in its dealings with *any* cooperating investor. I present conditions under which mutual cooperation is a Nash equilibrium. For the host country, a defection creates an immediate payoff of 4 but zero thereafter because all investors would not cooperate with it after its defection. On the other hand, a host country that continuously cooperates with investors would garner a payoff stream of

$$2+2\cdot\delta+2\cdot\delta^2+\ldots=\frac{2}{(1-\delta)}$$

Cooperation is optimal for a host country if and only if

$$\frac{2}{(1-\delta)}\geq 4$$

which is met when $\delta\geq 1/2$.

Given the payoffs presented and the assumptions outlined above, an investor would make an investment if and only if

$$2\cdot p\geq -2\cdot(1-p)$$

[13] Klein, "Promise Keeping," pp. 276-77.

and the host country in question has never reneged, where p is the probability of cheating by the host country. Ultimately, the level of δ required to encourage cooperation is determined by the payoffs. To illustrate this, say if the payoff to the host country from reneging were increased to 6 but everything else were kept the same, then cooperation is optimal if and only if $\delta \geq 2/3$. Therefore, a higher discount factor is needed to ensure cooperative outcomes if the payoff from defection were higher. In this game, cooperative outcomes is a Nash equilibrium when δ is large enough, but it is not subgame-perfect.

		Host country	
		D2	C2
Investor	D1	*U,V*	*U,V*
	C1	*-W,X*	*Y,Z*

Figure 4.3

More formally, let us consider the game and payoffs shown in Figure 4.3, with

$$0 < W, X, Y, Z$$

$$X > Z$$

$$V < X, Z$$

$$U < Y$$

Suppose the investor pursues the *tit-for-tat* strategy, but the host country decides to defect at the first round and return to cooperation thereafter. The present value of the chain of payoffs obtained by the host country in this scenario is

$$X + V \cdot \delta + Z \cdot \delta^2 + Z \cdot \delta^3 + \ldots$$

Cooperation, on the contrary, will offer

$$Z + Z \cdot \delta + Z \cdot \delta^2 + Z \cdot \delta^3 + \ldots$$

Thus, cooperation by the host country is optimal if and only if

$$Z + Z \cdot \delta \geq X + V \cdot \delta$$

which is true when $\delta \geq \frac{X - Z}{Z - V}$. Suppose only one of the payoffs changes when the rest are kept constant, a higher δ is needed to encourage cooperation from the host country when: X (payoff from unilateral defection) is larger, V (payoff when investor defects) is larger, and Z (payoff from mutual cooperation) is smaller.

Investors have the option of using the more robust *trigger strategy*. In that case, the host country that decides to defect will face a present value of payoffs

$$X + V \cdot \delta + V \cdot \delta^2 + \ldots = X + \frac{V\delta}{(1-\delta)}$$

which is incidentally the same as the payoffs the host country would receive if it intends to defect continuously when playing against investors using *tit-for-tat*. Similarly, cooperation is optimal if and only if

$$\frac{Z}{(1-\delta)} \geq X + \frac{V\delta}{(1-\delta)}$$

When $\delta \geq \frac{X - Z}{X - V}$, the host country could be induced to cooperate. It is straightforward to observe that $\frac{X - Z}{Z - V} \geq \frac{X - Z}{X - V}$ because $X > Z$. We again see that the *trigger strategy* sustains a Nash equilibrium of mutual cooperation in situations where *tit-for-tat* is not effective.

GAME THEORY & THE REAL WORLD

Game theory offers important insights into the dynamics of strategic interaction between autonomous rational agents. Although game theoretic scenarios do not capture fully the intricacies of interaction in the social world, the general conclusions derived can be quite profound. Game theory helps us appreciate how mutual cooperation is promoted by two environmental conditions: the promise of frequent and repeated interaction into the indefinite future, and transparent record of past behavior. These conditions, coupled with self-policing behavior by autonomous agents, are the underpinnings of long-term credibility considerations.

The environmental conditions and self-policing behavior act to foster a credibility mechanism that supports widespread mutual cooperation in settings lacking a "common government" to enforce contracts. If interaction were not repeated, then neither player has any incentive not to renege at the first instance that they interact together. If there were a predetermined end-point to any interaction, then neither party has any incentive to cooperate in the last round and cooperation unravels through backward induction. If the record of past behavior were not available or opaque, then cheaters would be able to take advantage of unsuspecting players. All the players would know this, and hence none of them would cooperate with one another for fear of being cheated. If the individual agents do not exhibit self-policing behavior, then community norms would be violated at will. The result would be the ultimate unraveling of the community of players.

It is notable that cooperation emerges from these games despite the absence of an external enforcement authority. It is the individual self-policing actions of the players

themselves that sustain mutual cooperation given the requisite environmental conditions. The voluntary aspect of how good conduct is elicited from rational and self-interested agents is particularly significant in the field of international relations where third-party enforcement is erratic and unsure. These insights help us understand how cooperation may be extracted from individual agents interacting in anarchic settings. Agents in the real world may not act strictly in the manner prescribed by game theory, but we should nevertheless expect them to behave in a self-policing manner when the right conditions are in place. There would be no mutual cooperation if such behavior were uncommon. Thus, *the requirement of self-policing behavior engenders a testable hypothesis of using past behavior as a determinant of the risk of transacting with a given agent.* This argument is explored in greater detail in the next chapter.

The players own actions create a setting where trust is enhanced. Commitments to cooperate are correspondingly more credible. In general, cooperative outcomes ensue as the credibility of the individual players increases. It is important to note that mutual cooperation flows from increased credibility. The more commitments of good conduct are believed, the more likely cooperation will result.

Commitments to cooperate are made more credible when the shadow of the future is long and the payoffs to cooperation are high. The strategic interaction between foreign investors and host countries has an infinite horizon characteristic. Banks and oil companies are long-lived, particularly those with extensive overseas investments, and though they may not exist for an infinite length of time, their demise is extremely difficult to forecast years ahead. Countries obviously have much longer life spans in general, and their mortality is even more difficult to predict. The reader may note an

apparent contradiction between my assertion of the longevity of states here and my detailed exploration of how certain governments may have higher discount rates than others in the following chapter. There is no contradiction. In game theory, there is a difference between the lifespan of a player and the shadow of the future it faces. How much an agent discounts future payoffs may be determined by various factors that are independent of its lifespan. For example, a person in his twenties who is aware that he has an average of a half-century of life ahead of him may well choose to consume all his income presently because of his strong personal preferences for consumption today instead of tomorrow.

The population of host countries and large investors in the issue-areas I am analyzing is also relatively very small. The small population of players and their longevity suggests that their interaction will be relatively frequent and repeated over time. Thus, the promise of frequent and repeated interaction into the distant future is very tangible in the issue areas of sovereign debt and foreign direct investment in petroleum. The record of past behavior in both issue-areas is also quite transparent. Instances of defaults, reschedulings, and expropriations are generally public information. Most importantly, the requirement of a commitment mechanism in both issue-areas is well-developed theoretically, and is discussed in detail in their respective non-empirical chapters. Sovereign debt and petroleum FDI are fields in which the game theoretic insights on the credibility of promises to encourage mutual cooperation are quite pertinent. Therefore, they make excellent issue-areas in which to examine for credibility effects.

Other than the environmental conditions that support credibility effects in a community of rational autonomous agents, there are the factors that affect the level of behavioral credibility of a given country. This is the second and "micro" dimension of credibility to which I referred briefly in the first chapter. Political variables such as degree of democracy and political instability influence the discount rate and payoffs of host countries. Political instability instigates governments to value current and near-future payoffs much more than those in the distant future. It also makes policymakers less likely to pursue unpopular policies that serve the interests of foreign creditors or investors, such as higher tax rates. Democratic governments may have lower payoffs from reneging on their promises to foreign investors because greater accountability and transparency reduce the ability of public officials to seize foreign assets for self-enrichment. Moreover, the stronger constitutional and legal framework existing in democracies make it more difficult for their governments to act arbitrarily and discriminate against foreign investors.

It is difficult, if not impossible, to derive testable hypotheses on credibility effects from the environmental conditions directly. Other than the self-policing hypothesis, I need to delve into the "micro" political determinants of level of credibility of a given country in order to obtain testable hypotheses. To test for credibility effects empirically, I need to observe if the variation on the observed risk premium is significantly explained by the variation on the hypothesized level of sovereign credibility.

Structural credibility determinants like GNP growth and world interest rates also no doubt affect a country's shadow of the future and payoffs. However, I am concentrating on behavioral credibility, which is more interesting politically and also

more challenging to model. The following chapter discusses the three variables that influence the level of sovereign behavioral credibility - past behavior, political instability and degree of democracy - in greater detail.

CONCLUSION

In social settings where third-party enforcement is rare, cooperative outcomes may still emerge. However, the lack of an overarching and external authority means that the individual agents themselves must bear the burden of punishing cheaters and rewarding good conduct. Mutual cooperation can indeed materialize under the self-policing activities of the agents when two background conditions are met.

Frequent and repeated interaction into the indefinite future supports mutual cooperation even when the unique Nash equilibrium of a single round play is mutual non-cooperation. Another important related condition is the availability and transparency of the past behavioral record of each agent. However, even when the environmental conditions for mutual cooperation and credibility formation are met, the autonomous agents must self-police their own community before the promise of cooperation can be realized. The two most popular self-policing strategies to in pursuit of cooperation are *tit-for-tat* and the *trigger strategy*. These strategies help ameliorate the dilemma in Prisoners' Dilemma, and support a Nash equilibrium of mutual cooperation. These strategies are also useful for a wide variety of games. Thus, mutual cooperation emerges from the self-interested actions of autonomous agents. Cooperative outcomes are possible in nearly all infinitely repeated games with a long enough shadow of the future, and are the result of enhanced credibility.

The characteristics of repeated interaction, indefinite horizon and transparency of past behavior are discernible in many areas of international relations. It is certainly evident in the issue-areas of sovereign bank debt and petroleum FDI. The requirement of self-policing behavior generates one testable hypothesis that is further explored in the following chapter. To generate other testable hypotheses, however, we need to turn to the "micro" determinants of credibility, namely the political variables that affect the level of behavioral credibility of a given country. In terms of game theory, the reliability of a given agent may be assessed from its discount rate and payoffs. The next chapter discusses the three variables that are hypothesized to influence the behavior of foreign investors towards a given host country.

TESTABLE HYPOTHESES & ISSUE-AREAS

In this chapter, I discuss how certain variables may affect the level of sovereign behavioral credibility for a given country. The preceding chapter was devoted to the exploration of the environmental conditions that give rise to the credibility mechanism that supports mutual cooperation. The right environmental conditions (frequent and repeated interaction into the indefinite future, and transparent record of past behavior) offer incentives and opportunities for international cooperation, but they do not determine the domestic conditions for credible commitment. Here I am concerned with the factors that influence the gradation of credibility of a given country, and their testable hypotheses. I will also discuss briefly the two issue-areas in the empirical portion of the dissertation.

A shift to this "micro" dimension of credibility is required because the existence or non-existence of credibility considerations is not directly observable. However, hypotheses concerning how certain variables affect the level of sovereign credibility of a given country are observable and testable. If the environmental conditions for credibility effects are satisfied in an issue-area, then it may be confidently argued that credibility effects are demonstrated if the pattern of strategic interaction within that issue-area does indeed vary according to the variables hypothesized to influence the level of sovereign credibility.

As discussed in the first chapter, credibility is a function of structural and behavioral factors, which follows the framework used in recent deterrence scholarship.[1]

[1] "The credibility of a deterrent threat depends upon the defender being perceived as possessing (1) military capabilities sufficient to inflict substantial costs on a potential attacker and (2) the will to use those

Although the deterrence literature has focused on the credibility of contingent threats, this study concentrates on the credibility of promises. The difference is slight because contingent threats are simply commitments to resist or retaliate.[2] The structural aspect of a state's credibility is a function of its material interests and capability to undertake what it has promised. It is easy to believe that a country would be more likely to undertake a commitment in line with its material interests, and where its material resources were adequate to the task. Structural credibility is a straightforward function of interests and means.

In the issue area of sovereign debt, for example, a state that has a large portion of its economy dependent on foreign trade would find it relatively more costly to default on its debt, compared to a state that trades less with the world. It would be in the material interest of a trading state to adhere to its debt commitments because a default would cut off external trade financing with serious consequences to the general economy. Furthermore, a state that is able to service and repay its debt easily would be seen as more credible in terms of fulfilling its sovereign debt obligations than one that has an onerous debt service requirement.

On the other hand, behavioral credibility denotes the willingness of a country to satisfy a commitment. It is well observed that the ability to undertake a commitment is intrinsically different from the willingness to do so. The two political variables hypothesized to determine the level of behavioral credibility for a given country –

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capabilities if necessary." In Paul K. Huth, *Extended Deterrence and the Prevention of War* (New Haven, CN: 1988), p. 4.

[2] There is an important distinction between denial and punishment in the deterrence literature. Deterrence based on battlefield denial is usually associated with conventional forces, while punishment is typically linked with nuclear weapons. Nevertheless, the distinction in trivial for our purposes since we are concerned with credibility *per se* when discussing the deterrence literature instead of the specific strategies

political instability and degree of democracy - are discussed in detail below. Furthermore, the insights from game theory tell us that the record of past behavior informs the country's potential investors how to deal with it. A cheating country should be shunned by foreign investors in the self-help environment of international political economy.

There are certain factors that influence a country's perception of the shadow of the future and its payoffs, which affect its level of credibility. Political instability contributes to higher discount rates as instability leads governments to focus on short-term gain. Governments that discount future payoffs heavily will be less concerned about the future penalties from present defection. Democracy, on the other hand, makes it difficult for governments and public officials to act arbitrarily or discriminate against particular investors. The greater transparency associated with democratic polities also prevent state officials from seizing the payoffs from defection for themselves and leaving the cost for the whole country to bear. Finally, the stronger legal framework in democracies also helps to protect the rights of foreign creditors and investors.

PAST BEHAVIOR

Past behavior is used as a signaling mechanism for how other players relate to a given player. A cheating player is ostracized, while a cooperating player is courted. The players do this in order to protect the interests of the community from cheaters in a self-help environment without an external enforcement authority. The individual self-policing actions of the players maintain and encourage mutual cooperation when the requisite environmental conditions are in place.

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associated with the specific targets of deterrence. The distinction is discussed in John J. Mearsheimer,

The players would pursue the strategy of punishing cheaters because it is in their collective interests to do so. Consistent failure to punish violators of community norms would lead to a breakdown of the community in the long-term. However, collective action is better supported when the population of players is homogeneous and small. Those players who fail to punish cheaters may themselves be punished by other players seeking to enforce community norms. Moreover, a strategy of cheating against cheaters in terms of the Prisoners' Dilemma game is profitable.

Another reason why players may be expected to take past behavior into account is that it may be used to predict future behavior. In other words, past behavior determines reputation. Reputation is shaped by explaining an actor's behavior in dispositional terms (e.g., Mexico is a bad debtor), and then using that interpretation of past behavior as a guide to predicting future behavior:

> [A] player's reputation...would be beliefs that other players hold about his unknown characteristics and on the basis of which they predict his behavior. These beliefs would depend on *their initial beliefs and on their observations of the player's past behavior* (italics mine).[3]

However, the game theoretic framework that I am following does not depend on reputational considerations, but it is another reason for players to use past behavior as a trigger mechanism for their actions vis-á-vis other players. Indeed in game theory, reputational models are much more complicated than models simply using past behavior as a trigger signal.[4]

Conventional Deterrence (Ithaca, NY: 1983), pp. 14-5.

[3] Paul Milgrom & John Roberts, "Predation, Reputation, and Entry Deterrence," *Journal of Economic Theory* 27 (August 1982): p. 283. See also Jonathan Mercer, *Reputation and International Politics* (Ithaca, NY: 1996), pp. 1-19.

[4] See David Kreps, Paul Milgrom, John Roberts, & Robert Wilson, "Rational Cooperation in the Finitely Repeated Prisoner's Dilemma," *Journal of Economic Theory* 27 (August 1982): pp. 245-52; David Kreps & Robert Wilson, "Reputation and Imperfect Information," *Journal of Economic Theory* 27 (August 1982):

As explained in the last chapter, a player gains credibility from having a good record of past behavior. At the risk of belaboring the point, I illustrate the credibility effect at work is a game that models the employment relationship, which is actually a close description of the asymmetric situation in the issue-areas I examine later. In this setup, employment of player B_1 by player A is in the form of an open-ended contract whereby B_1 agrees to wages that are set by the contract in exchange for unspecified direction by A. Before signing the contract, B_1 should logically worry about whether A will mistreat him during his employment. Even if B_1 has the option of quitting the job before the end of his contracted tenure, he will still suffer losses such as a period of unemployment or the cost of relocation if he quits. Consequently, B_1's bargaining position vis-à-vis A after signing the employment contract will be less than his position *ex ante.*

A's concern for future gains through cooperation offers a key reason why A will not exploit B_1 *ex post.* Imagine that A plays this game against not just a lone B_1, but an infinite sequence of Bs. If every present and future candidate (B_i) for employment is able to view the past record of A's treatment of his employees, and use that information to decide on how to act towards A and as a basis for evaluating A's character (e.g., good boss or bad boss), then cooperative outcomes will emerge. A will now have a reputation to protect. Once A cheats in an interaction with B_1 by mistreating him, A's behavior becomes common knowledge to all other parties B_i considering A as a boss. Each B_i is

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pp. 253-79; and Douglas W. Diamond, "Reputation Acquisition in Debt Markets," *Journal of Political Economy* 97 (August 1989): pp. 828-62.

interested only in his payoff from his interaction with A, and will spurn A as a potential employer if he finds out that A has cheated against B_1. The key is that the one-time gain through cheating will be less than the discounted sum of the infinite stream of payoffs player A could achieve through repeated play with the other players.[5]

In the game modeled above, only one of the actors (A) has an incentive to cheat in each game. But the result and intuition would be the same even if both actors have incentives to cheat. The availability of information on a particular player's past strategy *and* the freedom to choose one's partners will compel every player to establish a good track record so they can play in future games. As the number of players increase, so does the ability of each player to find another partner, if he find his current partner objectionable. This exerts increasing pressure to always play cooperatively. A player who chooses the noncooperative strategy will soon find himself having "no one to noncooperate with."[6]

The role of past behavior as a trigger signal is only supported when certain background conditions are met: frequent and repeated rounds of play into the indefinite future, and transparent record of past behavior. These prerequisites are not unreasonable in international financial relationships. They are readily observed and supported by theory in the issue-areas analyzed in this study. The general testable hypothesis is that countries with a bad record of past behavior will be treated as having less credibility than countries with good track records *ceteris paribus*.

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[5] The employment game example is taken from David M. Kreps, *Game Theory and Economic Modelling* (NY: 1990), pp. 65-72.

[6] Gordon Tullock, "Adam Smith and the Prisoners' Dilemma," *Quarterly Journal of Economics* 100 (Supplement 1985): pp. 1073-81.

H1: Countries that cheated in the past are less credible than countries with a "good" record of past behavior *ceteris paribus*.

POLITICAL DETERMINANTS

There are several political determinants that may contribute to enhancing or retarding credibility in international political economic relations. The two most important political determinants are political stability and degree of democracy. These political variables are hypothesized to influence outside perceptions of the level of sovereign behavioral credibility of a given country through their impact on the discount rate, the length of the shadow of the future and the payoffs faced by the sovereign state agent.

Political Stability

In terms of game theory, political instability increases the discount rate faced by governments. Governments in unstable polities are more likely to forgo future benefits for immediate gains. Time inconsistency is a class of problems that arise when the benefits from a relationship are realized in the present but the costs accrue over time. Since agents should be expected to do the best they can at each point in time, agents facing time inconsistent situations have an incentive to renege on their promises by harvesting the upfront benefits and repudiating the later costs. This is particularly acute in the case of sovereign states, who answer to no higher external authority. Governments expecting a short tenure in office would have a short time horizon. If this is true, then countries experiencing political instability would be more likely to repudiate their international promises when doing so realizes some immediate benefits but the costs are only felt in the future.

Furthermore, high discount rates means unstable governments have less ability to extract resources and undertake painful economic policies than more stable ones. Weak governments may be unable to pursue necessary fiscal and monetary policies that are sometimes needed to satisfy the interests of foreign creditors and investors, if such policies are politically contentious. Since unstable governments discount the future more, they tend to pursue policies that are myopic such as incurring large budget deficits and high levels of public debt.[7]

However, there are other costs to political instability. Political scientists have long believed that political instability has important implications for long-term economic growth and development. Chronic political instability is associated with lower rates of economic growth.[8] One argument concerning the baleful effects of political instability on economic policy point to how instability diverts resources from productive long-term investments to more easily protected activities and even capital flight. Thus, political instability may distort long-term economic policy-making. Instability may also foster and feed upon high-levels of wealth inequality.[9] Political instability also increases the uncertainty faced by investors concerning economic policies and conditions. Thus, political instability reduces sovereign credibility through as variety of ways.

When political scientists talk about political instability, they typically refer to two general kinds of instability: the instability generated by frequent regime changes, and the

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[7] Nouriel Roubini & Jeffrey Sachs, "Government Spending and Budget Deficits in the Industrial Countries," *Economic Policy* 8 (April 1989): pp. 99-132; Alberto Alesina & Guido Tabellini, "A Positive Political Theory of Fiscal Deficits and Government Debt in a Democracy," *Review of Economic Studies* 57 (July 1990): pp. 403-14; and Vittorio Grilli, Donato Masciandaro & Guido Tabellini, "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy* 13 (October 1991): pp. 341-92.

[8] Samuel P. Huntington, *Political Order in Changing Societies* (New Haven, CN: 1968).

[9] See Mancur Olson, *The Rise and Decline of Nations* (New Haven, CN: 1982).

instability engendered by violent domestic conflict.[10] My measure of political stability attempts to capture both stability in the tenure of the central government and acts of political violence. It estimates the probability that the chief executive of a given country will be replaced within a given year.

Many of the political instability indicators, particularly those associated with political events, will be drawn from the well-known *Cross-National Time-Series Data Archive* (CNTS) founded by Arthur Banks. A random effects probit approach is used to statistically estimate and generate the probability of a change in the executive. Countries experiencing political instability are hypothesized as less credible than countries with more stable governments.

H2: Countries experiencing political instability are less credible than politically stable countries *ceteris paribus*.

Degree of Democracy

Democracies may be advantaged relative to non-democratic states in terms of credibility because democracies in general promote greater transparency and place greater constraints on state action. The policymaking processes in democracies are generally more transparent and institutionalized. This not only suggests that the payoffs to democracies from various strategies are easier to deduce, but it also makes it more difficult for public officials in democracies to seize all the payoffs from defection for

[10] A third indicator of political instability is political legitimacy, which mostly refers to whether a political system is democratic or not. Some scholars have argued that non-democracies are inherently less stable than democracies over the long run.
See Charles Lewis Taylor & David A. Jodice, "Quantitative Research on Political Instability," in *World Handbook of Political and Social Indicators, 3rd Edition, Vol. 2* (New Haven, CN: 1983): pp. 1-15.

themselves or their associates. Public participation in policy debates and implementation also ensure that the interests of broad societal groups are not ignored to the advantage of the narrow group of officials and policy elites.

The hypothesis for the greater credibility of democracies is advanced according to three related arguments.[11] First, liberal political systems place limits on arbitrary state behavior, which help to foster a more efficient and healthier economy with solid and stable property rights. Democratic institutions curb the state's ability to extract rents from society, and provide the essential underpinning for secure property rights and a healthy market economy. Broad-based societal support for government policies also contributes to greater extractive capability over the long-run.[12]

Second, democracies are better able to commit credibly because their institutional structures promote transparency and permit high officials to be penalized easily when they act against the interests of broad societal groups. Representative institutions shift responsibility away from an unaccountable sovereign to elected officials who can be removed easily. Elections in liberal political systems permit private citizens to police state officeholders, and hold them accountable for their actions in office. Default on foreign debt, for instance, increases the price of overseas borrowing and imperil international trade, which is facilitated by international credit. Therefore, default has high

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[11] There is a fourth related argument concerning the higher credibility of democracies, namely when popularly elected legislatures are formally and intimately involved in crafting international agreements. The institutionalized inclusion of legislatures in international bargaining among democracies allows legislative preferences to be taken into account, and facilitates the eventual process of implementing international agreements. As credibility is driven partly by the perception of whether a state will in fact adjust policies so as to implement an international agreement, the institutionalized involvement of legislatures in the bargaining process enhaces the sovereign credibility of democracies. The more predictable the process of implementing agreements, the more credible will be the commitmentsof a state. See Lisa L. Martin, *Democratic Commitments: Legislatures and International Cooperation* (Princeton, NJ: 2000).

[12] David A. Lake, "Powerful Pacifists: Democratic States and War," *American Political Science Review* 86 (March 1992): pp. 24-37; Douglass C. North & Robert Paul Thomas, *The Rise of the Western World: A*

costs for the segment of the population that has close ties to the international economy. Groups that at first glance may be expected to be supportive of repudiation like labor may also act against repudiation because it would hurt the government's future ability to smooth consumption in hard times. Consequently, a government whose authority and legitimacy is based on the express consent of the governed may find it more difficult to act in a way that would deeply harm the interests of broad societal groups.[13]

Third, the legal principle of equality before the law that is the foundation of all liberal democratic constitutions, and the concept of the rule on law in general, prevent governments with strong democratic institutions from discriminating between creditors. Sovereigns in medieval Europe used "divide-and-conquer" strategies to prevent creditor boycotts when they defaulted. They reneged successfully against one group of creditors, while raising money from another. Equality before the law and the supremacy of the rule of law prevent modern-day democratic governments from utilizing the selective repudiation strategy. So it is more difficult for democratic governments to discriminate against particular investors. Cheating against an entire group of investors invites greater retaliation.[14]

There are, as a result, two major forms of liberties that together contribute to democracy: political rights and civil liberties. Political rights enable people to participate freely in the political process and to pick authoritative policy makers who make binding decisions affecting the community. Civil liberties, on the other hand, include the

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New Economic History (NY: 1973); and Douglass C. North, *Institutions, Institutional Change, and Economic Performance* (NY: 1990).

[13] Kenneth A. Schultz & Barry R. Weingast, *The Democratic Advantage: The Institutional Sources of State Power in International Competition* (Stanford, CA: 1996); and Douglass C. North & Barry R. Weingast, "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in 17th Century England," *Journal of Economic History* 49 (December 1989): pp. 803-32.

freedoms to develop views, institutions, and personal autonomy apart from the state, and would also include the independence of the judiciary. Annualized data on the two facets of political and civil liberties are publicly available from *Freedom House*, which also provides a single index score on degree of democracy based on the average of the political rights and civil liberties scores, which we term the "democracy index" score. The *Freedom House* indices have values that span from 1 to 7, with higher values denoting decreasing degree of democracy. *Freedom House* itself labels countries as "free," "partly free," and "not free" based on their democracy index scores. Countries whose combined averages for political rights and civil liberties fall between 1 and 2.5 are designated "free;" between 3 and 5 "partly free;" and between 5.5 and 7 "not free."[15]

The posited virtues of democracy would lead us to expect that a higher degree of democracy is associated with higher accountability of public officials and greater transparency of public transactions. More accountability and transparency should correspondingly lead to less corruption. A widely used measure of public corruption is the Corruption Perceptions Index (CPI) compiled by *Transparency International*, which has grown in sample size over the last several years and covers ninety-nine countries in the 1999 survey. The corruption index runs from 1 to 10 in descending degree of corruption. So a country with a corruption score of 9 is less corrupt than one with a score of 3.[16]

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[14] Schultz & Weingast, *The Democratic Advantage*; and John M. Veitch, "Repudiations and Confiscations by the Medieval State," *Journal of Economic History* 46 (March 1986): pp. 31-6.
[15] For more information on the methodology, please visit http://www.freedomhouse.org. Datasets on the democracy scores may also be downloaded from the site.
[16] Visit http://www.gwdg.de/~uwvw/icr.htm for more information on the work of Transparency International.

Using data from 1998 and 1999, I run simple correlations between the democracy index from *Freedom House* and the CPI from *Transparency International*. If the hypothesis concerning corruption is correct, I expect to observe negative correlations. The results are presented in Tables 1 and 2, and the correlations are indeed strongly negative for both years.

Table 1

		Corruption 99	Political Rights 99	Civil Liberties 99	Democracy Index 99
Corruption 99	Pearson Correlation	1.000	-0.591*	-0.693*	-0.662*
	Sig. (2-tailed)	-	0.000	0.000	0.000
	N	99	98	98	99

* Correlation is significant at the 0.01 level (2-tailed).

Table 2

		Corruption 98	Political Rights 98	Civil Liberties 98	Democracy Index 98
Corruption 98	Pearson Correlation	1.000	-.570*	-.681*	-.636*
	Sig. (2-tailed)	-	.000	.000	.000
	N	99	98	98	99

* Correlation is significant at the 0.01 level (2-tailed).

However, correlation estimates are only valid for linear relationships, and the scatterplots of the correlations show a decidedly non-linear relationship between corruption and democracy. Closer inspection reveals that corruption appears to be negatively correlated to level of democracy only for countries that possess a democracy index score at or below 2 (Charts 1 & 2). There does not appear to be any correlation, or a very weak correlation at best, between democracy and corruption for countries with democracy scores above 2. The scatterplots imply that the power of democratic

institutions and practice to constrain public corruption only asserts itself after certain levels of political rights and civil liberties have been achieved.

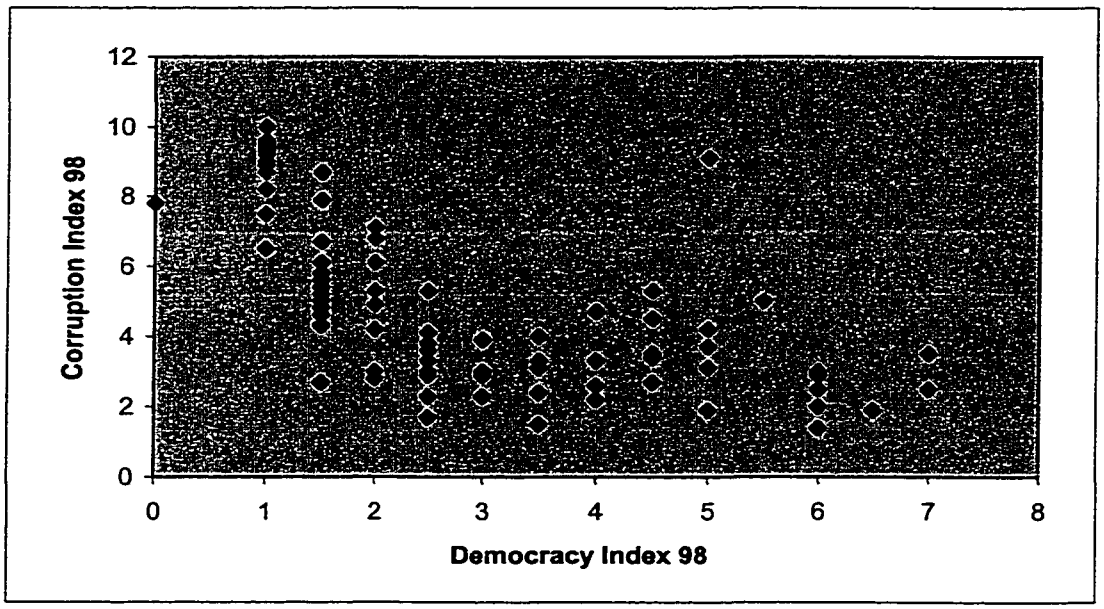

Chart 1

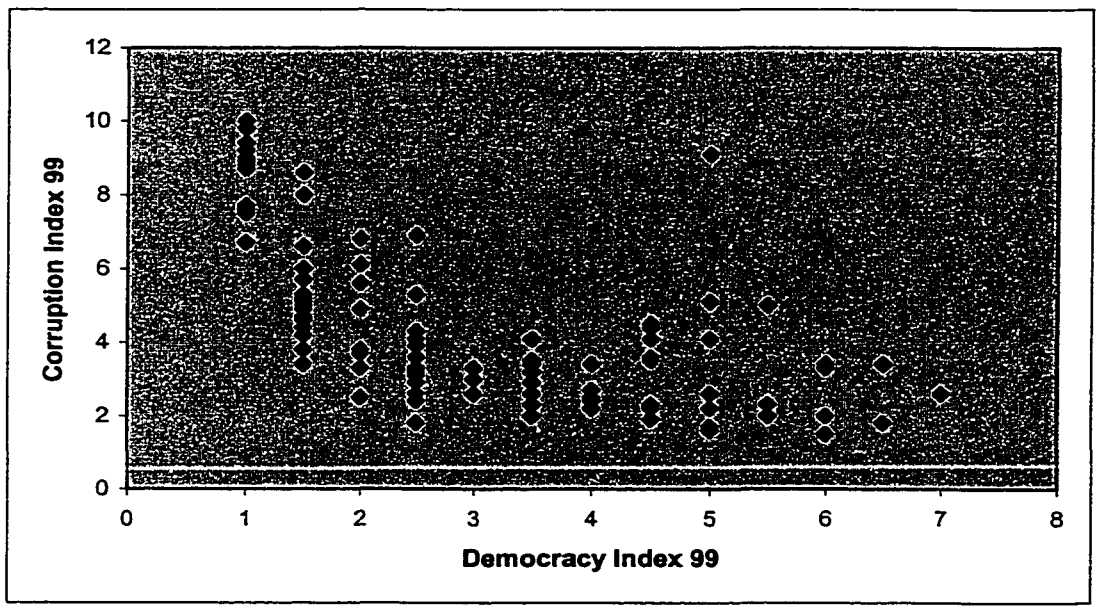

Chart 2

Perhaps accountability and transparency starts to increase only after a certain critical level of democratic institutions and practices have become institutionalized and embedded in society. Nevertheless, greater democracy is indeed strongly correlated with less corruption for countries with democracy index scores at or below 2 for the data from 1998 and 1999. This suggests that a discrete characterization of the degree of democracy may be appropriate.

Another important feature of the *Freedom House* data is that the democracy index scores are highly imprecise. It is almost impossible to identify statistically significant differences in the democracy rankings between two given countries. The mean democracy score from 1972 is 4.38 with a standard deviation of 2.05. The sizes of the confidence intervals around a given country's democracy index score are very large relative to the units in which democracy is measured. There are no countries for which a 90% confidence interval around the point estimate of the democracy index score for that country resides within a particular quartile of the distribution of the data. This finding is true for data from 1979 (mean 4.26, standard deviation 2.01), 1989 (mean 4.04, standard deviation 2.17) and 1999 (mean 3.50, standard deviation 1.98), and we may confidently assume for all the other years as well. This indicates that placing countries in even broad categories is subject to significant margins of error.

These analyses reveal that using a dummy variable to measure degree of democracy is better than using the index scores from *Freedom House*. There would certainly be no loss of accuracy since the data is already highly imprecise. To construct a dummy variable, countries with democracy index scores of 2 or less are labeled 1, while

countries with scores higher than 2 are labeled 0. I again use the corruption index data to test the hypothesis that democracies are less corrupt than non-democracies. The conclusion is that the null hypothesis of no difference in corruption levels may be rejected at the 99 percent confidence level for data from both years (Table 3). These results serve to support our use of a dummy variable as an indicator of democratic governance. Democracies are hypothesized to be more credible than non-democracies.

Table 3

	1998	1999
Mean of corruption index for democracies	6.6737	6.4143
Variance of index for democracies	4.5139	4.6164
n of democracies	38	42
Mean of corruption index for non-democracies	3.2929	3.1911
Variance of index for non-democracies	1.7782	1.7797
n of non-democracies	42	56
t-statistic assuming equal variances	**8.6101**	**9.1300**
P-value	0.0000	0.0000
t-statistic not assuming equal variances	**8.4225**	**8.5627**
P-value	0.0000	0.0000

H3: Democracies are more credible than non-democracies *ceteris paribus*.

According to the hypotheses outlined above, *higher levels of political instability should be negatively correlated with credibility*. Foreign investors would probably be worried if a host country were unstable politically. Moreover, *democracies are more*

credible than non-democracies, if the hypothesis is correct. Empirical analysis that demonstrates that credibility does vary according to these two political variables and past behavior would lend support to the hypothesis of the existence of credibility effects in international relations.

Data on the structural credibility of countries for the various issues considered in this study pertain to national economic indices. These data are widely available from various organizations and publications. The data on structural credibility for this study will be taken from annual national economic data compiled by the IMF and World Bank.

SOVEREIGN DEBT

There is an economics literature concerning the issue of reputation in sovereign debt relationships, but not on credibility specifically. Past behavior is invariably used as a proxy for "reputation" in the empirical literature on sovereign debt. Nevertheless, the models within which reputation is nested strongly imply a concern with credibility. The *ceteris paribus* principle is explicitly or implicitly used when economists discuss reputation in sovereign debt. Structural macroeconomic variables are invariably included as "controls" in the empirical studies, and occasionally a political instability measure too. Furthermore, it is taken for granted that past behavior is only one of many variables that creditors look at when evaluating the creditworthiness of sovereign borrowers.

The theoretical framework on sovereign debt demonstrates that the lack of a commitment mechanism to repay will not support an optimal consumption path for a given country. Countries borrow from abroad to smooth consumption over good and bad times. Failure to maintain a good repayment record causes a country to lose access to

international capital markets. Inability to borrow prevents a country from realizing its optimal consumption path. Consequently, it is in a country's interest to maintain a good repayment record.[17] There is a counter argument that asserts that only the threat of direct sanctions will motivate debtors to repay, and a country's ability to borrow would not be enhanced by a good repayment track record.[18]

It is important to note that both competing approaches essentially share a *dispositional characterization* of borrowers based on their past behavior in their credit relationships. The disagreement is over the nature of the sanctions necessary to motivate good behavior. Therefore, debt theory offers a theoretical basis for believing in the existence of reputation in international credit relationships. Default or rescheduling is typically public knowledge to all actors. International lending can also be easily viewed as an iterated game with a small and homogeneous population of players. So the prerequisites for credibility effects exist in the field of sovereign debt.

In a highly cited article, Peter Lindert and Peter Morton found a statistically significant correlation between the identity of problem debtors in one lending wave and problem debtors in the immediate following wave:

> In either worldwide lending crisis (the 1930s and 1980-86), the problem debtors tended to be those who had problems earlier. The pattern holds whether one looks across all countries or just across large samples of developing countries. We can

[17] Jonathan Eaton & Mark Gersovitz, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," *Review of Economic Studies* 48 (April 1981): pp. 289-309; and Herschel I. Grossman & John B. Van Huyck, "Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation," *American Economic Review* 78 (December 1988): pp. 1088-97.

[18] Jeremy Bulow & Kenneth Rogoff, "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review* 79 (March 1989): pp. 43-50; and Jeremy Bulow & Kenneth Rogoff, "A Constant Recontracting Model of Sovereign Debt," *Journal of Political Economy* 97 (February 1989): pp. 155-78.

> reject the notion that repayments breakdown in crises is uncorrelated with the same nation's distant debt history.[19]

Other studies have also found a statistically significant correlation between repayment history and current repayment behavior.[20] These empirical findings provide a basis for assuming that past behavior provides a potent guide for predicting future behavior.

The dependent variable in sovereign debt is the spread above the world risk-free interest rate. Presumably the risk premium accurately captures the international capital markets' perception of a country's credibility. The more credible a country's commitment to repay its debt, the lower the risk premium on its debt. The testable hypothesis with regard to past behavior is that *a bad repayment history is expected to lead to a higher cost of funds.* A bad repayment history means instances of sovereign defaults or reschedulings in the past.

In terms of the political determinants outlined above, *unstable governments should also be positively correlated with higher cost of funds.* If the hypothesis concerning the effects of democracy on behavioral credibility is true, I expect *democratic countries to pay a lower risk premium than non-democratic countries.*

The data for sovereign bank loan contracts is available for the period between 1975 to 1980 from *Borrowings in International Capital Markets.* Data on the interest rates for sovereign debt in general, which conflates both bank and bond debt, is also available from the *Global Development Finance* dataset published by the World Bank.

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[19] Peter H. Lindert & Peter J. Morton, "How Sovereign Debt Has Worked," in Jeffrey D. Sachs (ed.), *Developing Country Debt and Economic Performance, Vol. I: The International Financial System* (Chicago, IL: 1989), p. 61.

[20] Vassilis Hajivassiliou, "Do Secondary Markets Believe in Life After Debt?," World Bank Policy Planning and Research Working Paper #252 (1989); and Daniel McFadden, Richard Eckaus, Gershon Feder, Vassilis Hajivassiliou & Stephen O'Connell, "Is There Life After Debt? An Econometric Analysis of the Creditworthiness of Developing Countries," in Gordon W. Smith & John T. Cuddington (eds.), *International Debt and the Developing Countries* (Washington, DC: 1985), pp. 179-209.

The issues, data, and econometric models will be presented in greater detail in the chapters devoted to sovereign debt.

FOREIGN DIRECT INVESTMENT IN PETROLEUM

Foreign direct investment carry similar risks as sovereign lending. At the initial stages of an investment project, the foreign investor incurs large up-front costs in terms of investment, development, and technology transfer, but the benefits accrue over time. Therefore, much of the cost is borne *ex ante* by the investor, but the benefits are largely *ex post* in nature. The foreign investor needs to be able to realize the long-term benefits of the venture to compensate him for the initial cost of investment, but his ability to do so depends fundamentally on whether the host country government would interfere with the control and ownership of the project after it has been undertaken.[21]

The time inconsistency problem gives rise to changing bargaining strengths among the two parties to a foreign direct investment: the host country and the foreign investor. Although the host country may be keen to encourage an investment in its territory by promising to respect the ownership rights of the foreign investor vis-à-vis his investments, the bargaining position of the host country is strengthened immeasurably after the investment. The host country then has an incentive to renege on its former commitments, which may take the form of expropriation or nationalization. This simple time inconsistency problem has given rise to the "obsolescing bargain" theory of FDI.[22]

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[21] Thomas Andersson, *Multinational Investment in Developing Countries: A Study of Taxation and Nationalization* (NY: 1991), pp. 23-45.

[22] The concept of FDI as an "obsolescing bargain" is well-known. See C. Fred Bergsten, Thomas Horst & Theodore H. Moran, *American Multinationals and American Interests* (Washington, DC: 1978); and Raymond Vernon, *Storm Over the Multinationals: The Real Issues* (Cambridge, MA: 1977).

Host countries may interfere with foreign ownership in many ways, but for simplicity's sake we are concerned only with the most extreme policy choices faced by the host country government, namely no interference or expropriation.[23] Expropriation includes formal expropriation by the host country government, extra-legal seizures, forced sales to local private or public parties, and forced contract renegotiations that result in the effective transfer of ownership.[24] The terms expropriation and nationalization are used interchangeably in this study.

The theory of expropriation demonstrates that the lack of a commitment mechanism on the part of the host country not to expropriate will reduce the flow of investment capital into the country. Countries lacking the capital and skilled labor to carry out domestic investment projects have a strong incentive to project credibility. Inability to commit credibly to not expropriate foreign-owned assets reduces the amount of investment funds from overseas, and fewer projects will be carried out.[25]

There are generally two types of expropriation: mass and selective. Mass expropriation is ideologically motivated and non-discriminatory in its application. It is part of an ideologically inspired social revolution, and usually applies to all foreign enterprises or even all private enterprises. Instances of mass expropriations occurred in the Soviet Union in 1917, China in 1949, Cuba in 1959, and Ethiopia in 1975. Such expropriations are rare, and the overwhelming cases of nationalizations are in the form of

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[23] Possible forms of host country interference, in ascending order of interference: no interference, joint ventures, licensing agreements, technical assistance agreements, industrial cooperation, forced divestment either to local private or public hands.

[24] Stephen J. Kobrin, "Foreign Enterprise and Forced Divestment in LDCs," *International Organization* 34 (Winter 1980): pp. 67-9.

[25] Jonathan Eaton & Mark Gersovitz, "A Theory of Expropriation and Deviations from Perfect Capital Mobility," *Economic Journal* 94 (March 1984): pp. 16-40.

selective expropriations where nationalization is simply another policy option available to host country governments.[26]

Selective expropriation is an alternative to routine regulatory or administrative policies by host country governments to increase national control over the activities of foreign investors. Consequently, selective forced divestment is determined by industry-specific characteristics and host country government goals. Research has shown that the frequency of nationalization acts are uneven across industries. Politically sensitive industries like banking and public utilities are typically targeted in selective expropriations, as are extractive industries such as mining and petroleum where foreign investors are seen as acquiring unfair profits through exploitation of exhaustible national resources. Industries that are research intensive and globally integrated are much less vulnerable.[27] It is perhaps no surprise that the fall of the colonial empires following WWII has seen a relative decline in foreign investment in primary industries and a relative rise in foreign investment in manufacturing enterprises.[28]

The time inconsistency problem associated with FDI means that foreign investors should be concerned with the credibility of the host country government. Host country governments unable to project an image of credible commitment to allow foreign investors to maintain control and ownership would be less likely to attract FDI.[29] The differences in vulnerability to nationalization across industries make it imperative to focus on a single industry when doing empirical analysis. The observed historically high

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[26] David A. Jodice, "Sources of Change in Third World Regimes for Foreign Direct Investment, 1968-1976," *International Organization* 34 (Spring 1980): pp. 177-206.
[27] Kobrin, "Foreign Enterprise," pp. 75-8; and Jodice, "Sources of Change," pp. 180-84.
[28] Miles Kahler, "Political Regime and Economic Actors: The Response of Firms to the End of Colonial Rule," *World Politics* 33 (April 1981): pp. 383-412.
[29] Eaton & Gersovitz, "A Theory of Expropriation and Deviations from Perfect Capital Mobility," pp. 16-40.

incidence of selective expropriation in the petroleum industry makes it an obvious issue-area in which to test for sovereign credibility effects.

Although it would be best to analyze FDI across the world by firms of various nationalities, the scarcity of data compels me to concentrate on the activities of American investors. Detailed information on the FDI activities of U.S. resident investors is available from *U.S. Direct Investment Abroad* published yearly by the U.S. Department of Commerce. I will specifically focus on the data for FDI into "majority-owned non-bank affiliates of non-bank U.S. parents." Data on numbers of acts of expropriation from 1960 to 1980 in developing countries grouped by countries and economic sectors are available from Professor Thomas Andersson, presently at the OECD, who has generously made his dataset available to me.

There is no available variable of observations that fully encapsulates the risk premium associated with various FDI projects. Thus, I have to construct my own dependent variable. The dependent variable is the change in "Net Plant, Property, and Equipment" relative to the total oil output of the host country. All this is explained in greater detail in Chapter Six.

A country whose commitment to foreign control and ownership is credible would be able to attract FDI. The first testable hypothesis with regard to sovereign credibility in FDI is that *past acts of expropriation is negatively correlated with FDI inflows.* In terms of the political determinants outlined above, *political instability is expected to be negatively correlated with FDI inflows*. If the hypothesis concerning the effects of democracy on behavioral credibility is true, I expect *democracies to attract more FDI inflows relative to non-democracies*.

CONCLUSION

An analysis of the factors that affect the level of credibility of a given country is required to generate testable hypotheses about sovereign credibility. The level of behavioral credibility for a given country is influenced by a function of past behavior, political instability and degree of democracy. The testable hypotheses of behavioral credibility used in this study are derived from these three variables. Using structural variables as controls, I evaluate the claims concerning the pertinence and relevance of behavioral credibility in two important issue-areas of international political economy.

The arch-importance of past behavior as a signaling mechanism for potential partners was discussed in the preceding chapter. Foreign creditors and investors intent on sustaining cooperation should act to punish cheating host countries by ostracizing them. Furthermore, investors should be wary of countries experiencing high levels of political instability and be more welcoming of democracies. These two political factors are posited to have a significant affect on sovereign behavioral credibility through their impact on the payoffs and discount rates faced by governments.

The two issue-areas analyzed are sovereign bank debt and FDI in petroleum. They are issue-areas in which the effects of sovereign credibility are considered to be prominent, both intuitively and theoretically. The need for a commitment mechanism in order for optimal levels of investment to be achieved has been established theoretically for both issue-areas, as I will discuss. If indeed our empirical analyses do confirm the existence of significant credibility effects in both issue-areas, then that would demonstrate strong support for the main hypothesis of this study, namely that sovereign

behavioral credibility is a determinant of outside perceptions of the riskiness of a given country.

SOVEREIGN DEBT: THEORY AND HISTORY

J. Pierpont Morgan, arguably the most powerful banker in the world of his time, was hauled before the House Banking and Currency Committee in 1912 to answer charges about the putative "Money Trust." The most celebrated exchange between Morgan and Samuel Untermyer, the chief counsel of the committee, went as follows:

> *Untermyer*: Is not commercial credit based primarily upon money or property?
> *Morgan*: No sir, the first thing is character.
> *Untermyer*: Before money or property?
> *Morgan*: Before money or anything else. Money cannot buy it....Because a man I do not trust could not get money from me on all the bonds in Christendom.[1]

Although one must take Morgan's answers with a pitch of salt, it did contain some element of the truth. Credit before the advent of credit rating agencies and computer-aided analysis of creditworthiness flowed to people whom the banker knew and trusted personally. The old headquarters of J.P. Morgan bank on 23 Wall Street bore and still bears no identifying marks or nameplate, and entry was by invitation only. The old world of domestic "relationship finance" is now dead, and replaced by the more flamboyant "transactional finance," where there are no loyalties or enduring relationships. But the importance of credibility lives on in international finance.[2]

Sovereign bank debt is defined as loans booked directly by central or state governments and other state-controlled entities, plus publicly-guaranteed debt incurred by other organizations, from overseas private banks. These loans are typically valued in an international currency, usually the U.S. dollar, and priced according to a premium above the London Inter-Bank Offer Rate (LIBOR). Moreover, sovereign loans are usually

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[1] Quoted in Ron Chernow, *The House of Morgan: An American Banking Dynasty and the Rise of Modern Finance* (NY: 1991), p. 154.

sourced from bank syndicates in order to lessen the risk to any given lender. Note that sovereign bank debt is distinguished from sovereign bond debt.

A central issue in sovereign debt is whether there is an incentive for a country to faithfully repay its debt. It is no longer acceptable for industrialized countries to use their warships and marines to compel repayment by renegade sovereign debtors.[3] There is consequently a major enforcement problem because there is no tangible mechanism by which to ensure that the two parties to an international loan contract adhere to it. So countries seeking foreign capital must present convincing structural and behavioral credibility of their commitment to repay their creditors. Indeed, sovereign debt theory strongly supports the existence of a commitment mechanism in order for sovereign borrowers to first obtain funds from their creditors, as I will discuss in detail below. Lack of a commitment mechanism disadvantages a country seeking foreign funds to optimize consumption over time.

Three major factors distinguish sovereign debt from domestic private debt. First, willingness-to-pay is often more important that ability-to-pay because few problem sovereign debtors are strictly insolvent. Second, there is no legal framework for declaring sovereign bankruptcy. There is nothing akin to domestic bankruptcy procedures where an insolvent borrower could discharge his obligations, and start anew. Third, collateral plays little role in international lending. Even if a renegade sovereign debtor

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[2] See Ron Chernow, *The Death of the Banker: The Decline and Fall of the Great Financial Dynasties and the Triumph of the Small Investor* (NY: 1997).

[3] Past military interventions in pursuit of sovereign debt repayment may be a chimera. Victorian Britain and the United States tended to restrain themselves from intervening politically in sovereign debt repayment issues. Where military intervention occurred, it was driven as much by wider strategic-political concerns as by strictly debt repayment concerns. See Charles Lipson, "International Debt and National Security: Comparing Victorian Britain and Postwar America," in Barry Eichengreen & Peter H. Lindert (eds.), *The International Debt Crisis in Historical Perspective* (Cambridge, MA: 1989), pp. 189-226.

has overseas assets that its creditors could seize, such assets would likely amount to only a small fraction of the outstanding debt.[4]

Sovereign credibility is extremely important and pertinent to the field of sovereign debt. Insolvency has at least as much to do with inability-to-pay issues as it does with unwillingness-to-pay issues. Willingness-to-pay is largely influenced by political considerations. Furthermore, past repayment behavior is a theoretically important determinant of lending terms. Thus, behavioral credibility should be expected to influence the evaluations of sovereign risk by creditors. In this study and in the literature, a problem debtor means a country that either defaults or reschedules its debts.

Among the factors that are posited to influence behavioral credibility, economists have largely concentrated on the role of past behavior in determining lending flows. However, empirical studies using past behavior as an explanatory variable have invariably included structural credibility variables as controls, plus variables measuring political instability of various forms. Therefore, an implicit framework of credibility in sovereign debt can be said to exist, though there is no explicit overarching theoretical framework.

As discussed in the previous chapters, there is strong *a priori* reason to believe that past behavior, political instability and democracy may affect the level of credibility of a given country in the eyes of foreign creditors. Instead of assuming a strict economic perspective on sovereign lending, I utilize a political economic perspective that incorporates the political variables of domestic political instability and democracy as determinants of the risk premium of sovereign loan contracts. This chapter focuses on the

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[4] Jonathan Eaton, Mark Gersovitz & Joseph E. Stiglitz, "The Pure Theory of Country Risk" *European Economic Review* 30 (June 1986): pp. 481-513.

theory and history of sovereign lending, and the empirical analysis is left to the following chapter.

WILLINGNESS-TO-PAY

The willingness-to-pay problem is a major issue in sovereign debt because it is a very rare case where a country is truly economically insolvent. Insolvency strictly means that the present value of a country's current and future income is less than its debt obligations. A very simple formal definition of solvency is given by

$$D_0 \leq \sum_{t=0}^{\infty} (Y_t - A_t) / (1+r)^t$$

where D_0 is the current total debt stock, Y is national output, A is national absorption (A = Consumption + Investment + Government expenditures), and r is the interest rate on the debt. Therefore, indebtedness must be less than the discounted value of national output net national absorption. If the rate of growth of national output is higher than the debt interest rate, then the debt can be serviced without any reduction in either investment or consumption.[5]

However, sovereign debt is technically debt owed or guaranteed by the government and public agencies, so it is more accurate to inquire about the government's willingness to appropriate the net worth of the country in order to repay the public debt. A country's solvency is therefore not necessarily a good indicator of its capacity to repay the public debt. The government faces a budget constraint, and governmental solvency

[5] Vivek B. Arora, "Sovereign Debt: A Survey of Some Theoretical and Policy Issues," IMF Working Paper #93/56 (July 1993): p. 2.

should be evaluated against that benchmark. A simple formal definition of governmental solvency is given by

$$D_0^G \leq \sum_{t=0}^{\infty} (T_t - G_t) / (1+r)^t$$

where D_0^G is the government's net debt (excluding reserves), T represents the tax revenue, and G is government spending.

If we evaluate solvency with regards to sovereign debt in terms of the government's solvency instead of the country's solvency, interesting implications emerge. Even if the growth of national output is higher than the interest rate on the public debt, the government may become insolvent if the growth in its tax revenues is less than the debt interest rate. The government could also become insolvent if the growth of government spending outpaces the debt interest rate. The point is that governmental solvency largely depends on public policy considerations.[6] Hence, political instability and degree of democracy should be important influences on behavioral credibility in sovereign lending.

Political willingness-to-pay is a major factor in sovereign debt. Any assessment of a government's ability to repay the public debt must take into account political and social constraints. Increasing taxes or decreasing government expenditures is not a simple proposition. Using an extreme example from the eighteenth century, the French government's attempt to avoid a debt crisis by increasing taxes led directly to the French Revolution. Unstable governments will be less likely to raise taxes or cut public

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[6] *Ibid*, pp. 2-3. See also Homi Kharas, "The Long-Run Creditworthiness of Developing Countries: Theory and Practice," *Quarterly Journal of Economics* 99 (August 1984): pp. 415-39; and Jeffrey Sachs, "Theoretical Issues in International Borrowing," Princeton Studies in International Finance #54 (Princeton, NJ: 1984).

spending, so such governments are less credible than stable governments in terms of sovereign debt repayment.[7]

Moreover, unstable governments would have little incentive to enact economic policies that promote private economic enterprise through liberalization and privatization, and hence long-term debt repayment capacity, when such policies entail short-term pain. High political instability also causes policymakers to discount the future benefits from cooperation heavily, so they are less fearful of the future consequences of debt repudiation. Political instability encourages myopia among policymakers. Most importantly, political instability has a negative impact on long-term economic development and growth, as discussed in the last chapter.

Strong democratic institutions, on the other hand, constrain arbitrary behavior by state officials. Policymakers are much more accountable in democracies than non-democracies, so they are less likely to pursue policies that alienate broad societal groups. Different groups have the ability to participate directly or indirectly in policy debates in which they have an interest. Lastly, the strong legal framework and protections existing in institutionalized democracies offer a line of defense against arbitrary and discriminatory government behavior aimed at foreign creditors.

Other than the political variables of political instability and democracy, there is the third variable of past behavior. Self-policing behavior is a crucial strategy to support mutual cooperation, and I expect this to be no less true in the issue-area of sovereign debt. The relatively small population of long-lived foreign creditors should rationally pursue self-policing behavior in their repeated interactions with the population of long-

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[7] Martin Hellwig, "Comments on the Pure Theory of Country Risk," *European Economic Review* 30 (June 1986): p. 523.

lived sovereign borrowers, unless the former prefers to be continually cheated by the latter. Thus, countries that have bad repayment records should be punished in their present interactions.

SOVEREIGN DEBT THEORY

A literature attempting to answer the question of what incentives exist to motivate sovereign debtors to repay their debt emerged out of the debt crisis of the 1980s. There are several possible benefits or penalties to motivate a sovereign debtor to repay, but the greatest prominence is accorded to the penalty of exclusion from credit markets in the future. The two distinct theoretical approaches adopted by economists assume that countries borrow to smooth consumption in bad economic times. The first and earlier approach attempted to answer why sovereign debtors ever repay their debts. It demonstrates that that a sovereign debtor has an overriding incentive to make repayments in order to allow it continued unhindered access to international capital markets. The welfare gains realized through the use of foreign credit would allow optimal consumption smoothing across good and bad output years.[8]

Consider a country that faces a gross world interest rate $r > 0$, and has a discount factor $\delta < 1/(1+r)$.[9] At any time t, the country seeks to maximize an intertemporal utility function given by

$$U_t = \sum_{t=0}^{\infty} \delta^t u(c_t)$$

[8] Jonathan Eaton & Mark Gersovitz, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," *Review of Economic Studies* 48 (April 1981): pp. 289-309; and Herschel I. Grossman & John B. Van Huyck, "Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation," *American Economic Review* 78 (December 1988): pp. 1088-97.

where $u(c_t) = \log(c_t)$ is assumed to be the country's utility function. For simplification, I assume this country's output y_t is exogenous and deterministic and there is no storage technology, which means the output per period must be fully used. The country's debt then evolves according to $D_{t+1} = (D_t - p_t)$ where p_t is the payment made by the country to its creditors at time *t*. A negative p_t would denote a transfer from the creditors to the country instead. Consumption at time *t* depends on contemporaneous output (y_t) and debt repayment (p_t): $c_t = y_t - p_t$, so we exclude investment and government expenditures for simplification.

If the country could commit credibly to repay its debt, it would face a constrained maximization problem given by

$$Max_{c_t} U = \sum_{t=0}^{\infty} \delta^t u(c_t)$$

$$\text{s.t.} \sum_{t=0}^{\infty} \left[\frac{c_t}{(1+r)^t} \right] \leq \sum_{t=0}^{\infty} \left[\frac{y_t}{(1+r)^t} \right]$$

where the constraint is a simple feasibility constraint requiring that the present value of future consumption not exceed the present value of future output. The first order condition for the maximization problem is

$$\delta^t u'(c_t) = \lambda(1/(1+r)^t)$$

$$\lambda = [(1+r)\delta]^t u'(c_t)$$

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[9] The following model is adapted from Jonathan Eaton & Raquel Fernandez, "Sovereign Debt," National Bureau of Economic Research Working Paper #5131 (Cambridge, MA 1995), pp. 4-6.

where λ is the Lagrange multiplier associated with the feasibility constraint. It is specifically the marginal utility of wealth, and measures how much utility increases for a small increase in consumption from reducing debt repayment.[10]

Now suppose that y_t only be either y_H in odd periods and y_H in even periods, with $y_H > y_L \geq 0$. The present value of the country's future resources is denoted as V_0. Were the country able to commit credibly to repay its debt, its optimal consumption path would satisfy

$$c_t^* = [(1+r)\delta]^t V_o - [(1+r)^t \delta^{t+1}]V_0$$

$$c_t^* = [(1+r)\delta]^t (1-\delta)V_0$$

where c^* is the optimal consumption path. An important implication of the optimal consumption path is that as $t \to \infty, c^* \to 0$ since $[(1+r)\delta] < 1$, which means that the country borrows to increase its initial consumption and then slowly reduces its consumption to zero over time to fully repay its debt.

If I drop the assumption of a credible commitment to repay, then I must add another constraint to the constrained maximization problem, namely an incentive compatibility constraint. This additional constraint would be

$$\overline{V}_t = \sum_{t=0}^{\infty} \delta^t u(\bar{c}_t) \geq V_t = \sum_{t=0}^{\infty} \delta^t u(y_t)$$

where $\bar{}$ denotes the value of the variable given that the country is following some specified debt repayment path, and $c_t = y_t$ under financial autarky. The incentive compatibility constraint captures the requirement that at every moment of time t, the

[10] Sachs, *International Borrowing*, p. 8.

country must be at least as well off fulfilling its repayment obligations as it would be by defaulting on its debt and consuming its autarkic output thereafter.

We can see immediately that the incentive compatibility constraint is violated by the implication of decreasing consumption over time derived from the optimal consumption path equation. This is because the country would be consuming an amount strictly smaller than y_L after some time *t*. In other words, the incentive compatibility constraint plus the feasibility constraint imply that the original optimal allocation is virtually impossible. Therefore, the country would not be able to follow a borrowing path that would support its optimal consumption path without a credible commitment mechanism. *The optimal consumption path is unsupportable without a commitment mechanism.*

There remains the issue of whether the threat of exclusion from future borrowing is sufficient to support *any* borrowing at all. There is a credit ceiling above which further lending by creditors would be inadvisable. The credit ceiling depends on the creditors' evaluation of the country's point of indifference between retaining future access to consumption smoothing and the windfall gain from defaulting on its debt. This ceiling is higher if the variability in output is higher, and if the creditors can impose greater penalties. However, inability to commit credibly to repayment means that the amount a country could borrow would be the minimum of two figures: what it wishes to borrow and the credit ceiling imposed by its creditors.[11]

Similar models are used in other studies, whether of two periods or infinite horizon, and whether of deterministic or stochastic fluctuations in output. The

[11] Eaton & Gersovitz, "Potential Repudiation."

conclusions are that countries seek access international borrowing in order to smooth consumption and increase their welfare. Inability to commit credibly prevents the optimal consumption path from being realized. Therefore, the role of sovereign credibility is deeply etched into sovereign debt theory. Non-credible borrowers will be unable achieve their optimal consumption path.

The anti-reputation school, on the other hand, assumes that "small countries", which are defined as those that cannot affect the world interest rate, could always invest abroad in "cash-in-advance" insurance contracts that will enable them to smooth consumption in hard times. When the present value of the debt owed by the government *reaches its maximum*, in each subsequent time period the government would on net be paying back its creditors. Any rational agent in such a position would have an incentive to default, and invest the funds earmarked for debt service in the insurance contracts. The country would then be able to enjoy higher consumption in each subsequent period than if it had faithfully adhered to its debt obligations. Therefore, a good reputation would not help in securing loans because the implications of the availability of "cash-in-advance" contracts would be clear to the protagonists.[12]

To illustrate the general outlines of the anti-reputation argument,[13] consider the situation whereby an investment of I_{t+1} units in period t produces output of ρI_{t+1} units in period $t + 1$. ρ is a deterministically fluctuating productivity parameter that determines the investment's gross return. For simplicity, assume

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[12] Jeremy Bulow & Kenneth Rogoff, "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review* 79 (March 1989): pp. 43-50; and Jeremy Bulow & Kenneth Rogoff, "A Constant Recontracting Model of Sovereign Debt," *Journal of Political Economy* 97 (February 1989): pp. 155-78.

[13] The following model is adapted from Harold L. Cole & Patrick J. Kehoe, "Reviving Reputation Models of International Debt," *Federal Reserve Bank of Minneapolis Quarterly Review* 21 (Winter 1997): pp. 22-4.

$$\rho_t = \begin{cases} \rho, & \text{if } t \text{ is odd} \\ 0, & \text{if } t \text{ is even} \end{cases}$$

This is consistent with the earlier notation of deterministic output fluctuations when $y_L = 0$. The interest rate for the loan to finance a one-period investment remains as r. I assume $\rho > r$ because it would be illogical for the creditors to fund a project where the return is less than the interest rate of the loan.

Therefore, the government borrows 1 unit (assuming 1 unit of borrowing simplifies things enormously and the conclusion is the same if we assume borrowings greater than 1 unit) to invest during an odd period, and obtains $(1 + \rho)$ amount of output in the following even period. The government then repays the creditor $(1 + r)$, and consumes the remaining $(\rho - r)$. The discounted value of consumption under this scenario is

$$(\rho - r) + \delta^2(\rho - r) + \delta^4(\rho - r) + \ldots = \frac{(\rho - r)}{(1 - \delta^2)}$$

Now consider the scenario where the government could invest in some financial instruments similar to an insurance policy where a return of r, which is the same return as that demanded by the creditors, is guaranteed during odd periods. In the original formulation, if the government repays at an even period, say t, it gets to consume $(\rho - r)$ at t, $(\rho - r)$ at $t+2$, and so on. However, with this new financial instrument, the country could default at t and consume $(\rho - 1/r)$ while placing $1/r$ in the financial instrument. In the following odd period $t+1$, the insurance policy returns $r * (1/r) = 1$ unit to the country, and the government has enough to invest for the next period. In period $t+2$, the investment yields ρ, the country consumes $(\rho - 1/r)$, and places $1/r$ in the insurance

policy. This scenario offers a higher consumption in all even periods than if the country were to obediently repay its borrowings

$$(\rho - 1/r) > (\rho - r)$$

Thus, the government would have no incentive to repay its debt after obtaining 1 unit of loans from its creditors. It would prefer to default, and live off the proceeds of the cash-in-advance insurance contract. By doing this, it could consume more while still financing the original investment pattern. Consequently, Jeremy Bulow and Kenneth Rogoff assert that only the threat of direct sanctions will motivate debtors to repay. The most feasible kind of sanctions in a world where gunboat diplomacy is longer acceptable are blocking normal access to trade credits and seizures of assets held abroad in industrialized countries. Therefore, a country that trades more with the world and has large holdings of assets overseas will be more susceptible to the penalties of default. In other words, susceptibility to the economic penalties of default is an important component of structural credibility.[14]

Although the theoretical framework of the anti-reputation school is correct, many scholars and policy-makers have rightly asked whether it is actually practicable. First, it may be very costly to obtain such cash-in-advance contracts, or the rate of return on them may be smaller than the return demanded by the creditors. Second, although a country is free to renege on its obligations to its creditors, the argument assumes that the insuring party could commit itself not to renege on a defaulting country. Third, any payments to a

[14] Bulow & Rogoff, "A Constant Recontracting Model," pp. 157-59; and Eaton, Gersovitz & Stiglitz, "Pure Theory of Country Risk," pp. 491-92.

defaulting country may be seized by its creditors since the insurers are likely to be located in industrialized countries.[15]

There is disagreement among economists over the nature of the sanctions necessary to motivate good behavior. However, there is broad agreement about the concern with credibility. *The ability to project credibility is required before a country can achieve its optimal consumption path through borrowing.* Borrowers seeking to optimize their welfare over time should be concerned their credibility to repay debt incurred. Creditors who do not want to be systematically fleeced should seriously evaluate the credibility of potential borrowers. The prerequisite of a transparent record of past behavior is not difficult to satisfy in sovereign debt. Defaults and reschedulings are typically public knowledge to all actors, and are easy to observe. International lending can also be easily viewed as an iterated game with a relatively small population of players. Given these conditions, I expect past behavior to influence bankers' perceptions of particular countries. Moreover, political instability and degree of democracy should also help determine the level of behavioral credibility of a given sovereign borrower.

Nevertheless, punishing low credibility countries by excluding them from access to international capital markets requires the assumption that banks can collectively work together to pursue an exclusion policy, which should not be taken for granted as we will see later. Exclusion, if it happens, also need not be forever. Former defaulters who can signal a credible change of heart may be able to borrow again.[16] There is little empirical evidence of concerted exclusionary policies by banks towards former defaulters. Perhaps

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[15] Eaton & Fernandez, "Sovereign Debt," pp. 12-3; and William R. Cline, *International Debt Reexamined* (Washington DC: 1995), pp. 10-1.

a better dependent variable is the spread on loans. The spread between the interest rate for a loan and the world's risk-free interest rate basically corresponds to the risk premium attached to the loan. We can consequently infer the lenders' perception of sovereign credibility from the size of the spread. Even if low credibility borrowers are not punished through exclusion, there may still be subject to a higher cost of funds.

However, Peter Lindert and Peter Morton have discovered that private banks did not generally charge higher premium, or lend at shorter terms, or lend less, to low credibility debtors during the late 1970s (1976-1980). They conclude that "repayments history...was ignored."[17] This surprising finding is confirmed by other studies. Eliana Cardoso and Rudiger Dornbusch found that the faithful repayer Argentina enjoyed no better access to the international capital markets between the 1930s and the 1960s than the defaulting Brazil. Erika Jorgensen and Jeffrey Sachs also found no systemic difference in flows of external capital in the period from 1950 to 1964 when comparing Argentina with Bolivia, Chile, Colombia and Peru. Barry Eichengreen could find no negative correlation between the volume of external capital to public borrowers and prior incidences of default in 1935 for the period 1945-55 in Latin America.[18]

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[16] Harold L. Cole, James Dow & William B. English, "Default, Settlement and Signaling: Lending Resumption in a Reputation Model of Sovereign Debt," *International Economic Review* 36 (May 1995): pp. 365-85.

[17] Peter H. Lindert & Peter J. Morton, "How Sovereign Debt Has Worked," in Jeffrey D. Sachs (ed.), *Developing Country Debt and Economic Performance, Vol. I: The International Financial System* (Chicago, IL: 1989), p. 63.

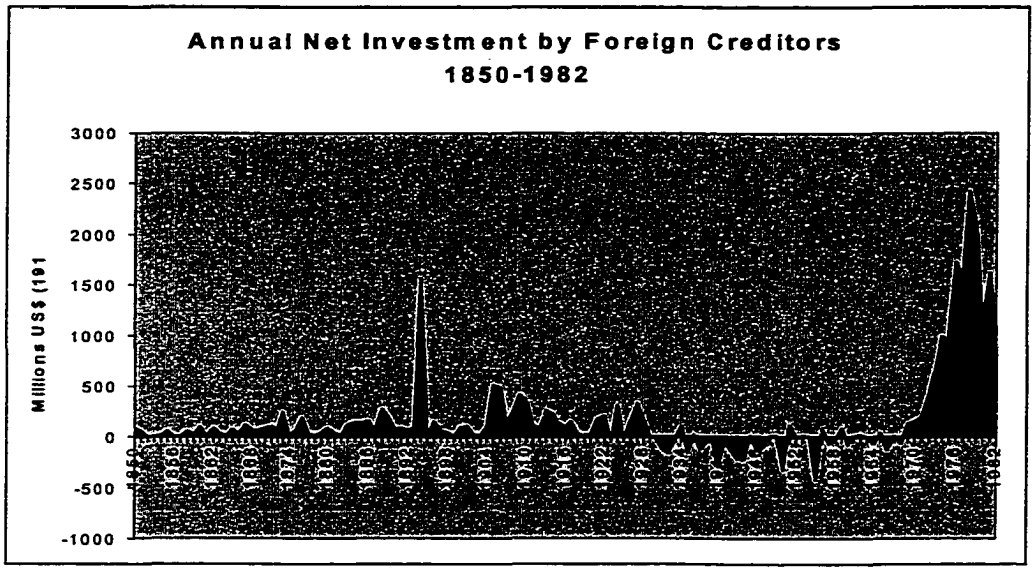
[18] Eliana Cardoso & Rudiger Dornbusch, "Brazilian Debt Crisis: Past and Present," in Barry Eichengreen & Peter H. Lindert (eds.), *The International Debt Crisis in Historical Perspective* (Cambridge, MA: 1989), pp. 48-85; Erika Jorgensen & Jeffrey Sachs, "Default and Renegotiation of Latin American Foreign Bonds in the Interwar Period," in Eichengreen & Lindert, *International Debt Crisis*, pp. 48-85; and Barry Eichengreen, "The U.S. Capital Market and Foreign Lending, 1920-1955," in Sachs, *Developing Country Debt and Economic Performance*, pp. 107-58.

LIQUIDITY CRISES

The studies based on data between WWII and 1970 may be confounded by a liquidity crisis. There are empirical and theoretical bases for believing that private lending to sovereign borrowers follows a boom-bust cycle where excessive investment is invariably followed by excessive retrenchment. It is important to note this phenomenon because empirical studies that focus on periods of liquidity crises at the tail-end of a boom-bust cycle may fail to uncover any credibility effects simply because of the situational constraints. Consequently, empirical examinations of sovereign debt should try to sidestep periods of liquidity crises.

The boom-bust cycle in sovereign debt has existed since at least the early eighteenth century. The first sovereign lending wave for which data is available occurred in the 1820s followed by widespread repayment difficulties. The tide has repeatedly crested and fallen through the decades.[19] From Graph 1 we can see that the contraction in lending that occurred in the 1930s generally lasted until the 1970s. The lending wave in the 1970s reached its zenith in the years between 1975 and 1980.

[19] See Charles Kindleberger, *Manias, Panics, and Crashes: A History of Financial Crises* (NY: 1978); and Albert Fishlow, "Lessons From the Past: Capital Markets During the 19th Century and the Interwar Period," *International Organization* 39 (Summer 1985): pp. 383-439.



* Annual real net investment by private foreign creditors in the sovereign debt of ten countries, 1850-1982. The ten countries are Argentina, Australia, Brazil, Canada, Chile, Egypt, Japan, Mexico, Russia, and Turkey. The figures are in millions of US dollars at 1913 prices. Payments of interest are not included, nor are changes in the real value of outstanding debt due to movements in the consumer-price deflator. The large spike of 1894 was caused by a loan package of $1,489.5 contracted by the Russian government, much of which may have been purchased by Russian creditors.[20]

Graph 1

During crisis periods, private creditors retreated and indiscriminately shut out all sovereign borrowers from new credit, and defaulters and faithful borrowers suffered alike. As explained above, several studies that focused on the period during and/or immediately following a debt crisis have indeed found no correlation between a borrower's past repayment history and capital market access.[21] Instead of concluding that credibility plays no role in the pricing of sovereign debt, these studies perhaps demonstrate the closure of the international capital market to all borrowers in the aftermath of a crisis.

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[20] These 10 countries accounted for 78.8% of *all* external sovereign debt to private creditors in 1913-14; 51.5% in 1930; and 44.8% in 1979. Those periods correspond to the end of historical lending waves. See Lindert & Morton, "How Sovereign Debt Has Worked," pp. 42, 46-7, 99.

[21] Peter H. Lindert, "Response to the Debt Crisis: What is Different About the 1980s?" in Eichengreen & Lindert, *International Debt Crisis*, pp. 227-75.

Jeffrey Sachs has put forward a model of liquidity crises based on banks facing a rising marginal cost of lending, which could be due to domestic regulation limiting bank exposure to any single borrower and managerial risk aversion. In a liquidity crisis, a country would need a large loan to tide it over its temporary income shortfall, and all its creditors have a collective interest to extend further credit to protect their investment. However, the rising marginal cost of lending precludes any one bank from extending a large loan. The resulting collective action problem caused by the risk-averse behavior of individual creditors sparks a general credit squeeze that ends all lending.[22] There may also be the complication of a bargaining impasse between the sovereign borrower and the creditor cartel over the terms of new lending.[23]

The phenomena of creditor panics and wholesale shutdown of the international capital market add an interesting dynamic to international credit relationships. The wavelike nature of sovereign debt relationships offers a compelling reason why numerous empirical studies on the effect of past behavior have yielded negative results. Perhaps the reason why most studies have discovered no past behavior effects is because the collective action problem outlined above smothered the effects as creditors retreated in panic. We should thus turn to specific periods of lending waves to search for the elusive

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[22] A prominent liquidity crisis model is presented in Sachs, "International Borrowing," pp. 29-32. Jonathan Eaton, Mark Gersovitz and Joseph Stiglitz dispute Sachs' model:

> The assumption of an increasing marginal cost to each bank of lending may be questioned.... Even if the cost of capital increases with exposure, once some amount has been extended, a bank may be willing to commit further funds to prevent the loss of the original commitment even if, standing alone, the yield would be inadequate. Consequently, it is a bank with an initially large exposure that will find the value of extending further credit the greatest.

See Eaton, Gersovitz & Stiglitz, "Pure Theory of Country Risk," p. 498.

[23] Paul Krugman, "International Debt Strategies in an Uncertain World," in Gordon W. Smith & John T. Cuddington (eds.), *International Debt and the Developing Countries* (Washington, DC: 1985), pp. 88-91.

credibility effect. It is reasonable to assume that the collective action problem plaguing creditors would be less compelling during lending waves.

BOOM AND BUST

Developed country bankers loaned vast amounts of money to developing countries in the 1970s. Many experienced bankers appeared to believe that lending to countries was inherently less risky than lending to private firms. The then-Chairman of Citicorp is often popularly paraphrased as saying that "countries don't go bankrupt." What Walter Wriston actually said about sovereign debtors was more subtle, but the point was the similar:

> The infrastructure doesn't go away, the productivity of the people doesn't go away, the natural resources don't go away. And so their assets always exceed their liabilities which is the technical reason for bankruptcy. And that's very different from a company.[24]

The point is generally correct because it is indeed the rare case where a country becomes strictly insolvent, but it fails to appreciate the possibility of governmental insolvency. Furthermore, there was ample justification for the bankers' enthusiasm for sovereign lending because the risks did indeed seem low during the 1970s. Citibank's losses on outstanding foreign sovereign loans were only 0.29 percent during the 1970s, in comparison to 0.70 for domestic loans. In a Group of 30 survey made in 1982, two-thirds of the surveyed banks reported that international lending was more profitable than domestic lending.[25]

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[24] Quoted in Raul L. Madrid, *Overexposed: U.S. Banks Confront the Third World Debt Crisis* (Washington, DC: 1990), pp. 70-1.

[25] Jack M. Guttentag & Richard J. Herring, "Disaster Myopia in International Banking," Princeton Essays in International Finance #164 (Princeton, NJ: 1986), p. 10.

Much of the commercial credit extended to developing countries went to government development projects or state-owned entities. In the prevailing environment of economic nationalism in which expropriation of foreign-owned assets was popular, foreign currency bank loans appeared to give public officials more control over the allocation of capital and domestic economic activity. Bank loans were more attractive than foreign direct investment because of the latter's implications of foreign control and dependence. Furthermore, the swelling petrodollar deposits in the Euromarkets demanded a massive capital recycling effort. The flow of capital that occurred was more than anyone had thought possible.[26]

The relaxed attitude the major banks took towards loans to developing countries in this period is alarming at hindsight. Banks loans to Brazil, for instance, between 1975 and 1979 rose 30 percent per annum. Loans to Argentina, Chile and South Korea chalked up even more impressive gains, with increases of over 40 percent per annum. The growth in international lending was highest to those countries where banks already had the largest loans outstanding, which resulted in considerable concentration of loans to a handful of countries. Most of the lending was carried out by twenty-five to thirty private international banks, and most of the funds went to some fifteen developing countries. So the lending boom was concentrated on both ends.[27]

It is extremely difficult, if not impossible, to predict even near future occurrences, especially concerning great but rare shocks.[28] The bankers certainly failed to foresee the

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[26] See Jeff Frieden, "Third World Indebted Industrialization: International Finance and State Capitalism in Mexico, Brazil, Algeria, and South Korea," *International Organization* 35 (Summer 1981): pp. 407-31.
[27] Rimmer de Vries, "Perspective: Country Risk, A Banker's View," in Richard J. Herring (ed.), *Managing International Risk: Essays Commissioned in Honor of the Centenary of the Wharton School, University of Pennsylvania* (NY: 1983), p. 178; and Frieden, "Third World Indebted Industrialization," p. 411.
[28] See Guttentag & Herring, *Disaster Myopia.*

heights to which interest rates in the United States would rise in the early 1980s as the Federal Reserve attempted to slay the inflation dragon. Real short-term interest rates in the United States had been negative in 1977 and 1978, but would rise to an average of 8.9 percent in 1981 and 8.1 percent in 1982. As most of the foreign currency sovereign loans to developing countries were tied to the London Inter-Bank Offer Rate (LIBOR), interest rate increases caused correspondingly heavier debt service loads for the debtors.[29]

Moreover, the combined effects of the interest rate and energy price increases in the developed countries reduced economic growth in those countries. Real GDP growth in the developed countries fell from 3.5 percent in 1979 to 1.3 percent in 1980. It stayed at 1.3 percent in 1981, but further fell to –0.2 percent the next year. Lower economic activity in the developed countries, in turn, caused demand for commodities from the developing countries to fall precipitously. Lastly, the strong rise of the dollar in the exchange markets during the early Reagan years increased the real cost of servicing dollar loans.[30]

The triple effects of high interest rates, recession in the industrial countries and high dollar exchange rate transformed the economic prospects of the developing countries from one of promise to crisis. Although there were cases of debt difficulties prior to 1982, these were treated as isolated cases that posed no systemic threat to the international financial system. The problem began when Mexico, which was one of the largest sovereign borrowers during the 1970s, announced in August 1982 that its reserves were exhausted and foreign currency debt would no longer be serviced. Within several

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[29] Harold James, *International Monetary Cooperation Since Bretton Woods* (Washington, DC: 1996), pp. 354-55.
[30] James, *International Monetary Cooperation*, pp. 355-57.

weeks similar crises emerged in Argentina and Brazil, and the debt crisis of the 1980s arrived in full force.[31]

Immediately after the announcement by Mexico of its debt problems, banks ran for the exits and tried to reduce their outstanding exposures to debtor countries. The smaller banks ran the fastest in the ensuing panic. The breakdown of the international financial markets exacerbated the problems already faced by sovereign borrowers. Net financing for many major sovereign borrowers turned negative, which meant a net outflow of capital from the stricken countries.[32]

Although there are studies showing how banks cooperated successfully to preserve collective action in rescheduling negotiations and the disbursement of new loans to troubled borrowers,[33] the evidence points to a general creditor retreat during the debt crisis, particularly from Latin American and African borrowers. Domestic governments and international organizations placed great pressure on the banks to proffer new loans in a procedure variously termed as "concerted lending," "involuntary lending," or "forced lending." The last term most clearly explained the situation in which banks found themselves. Nevertheless, creditors retreated where they could:

> ...international banks tried to rescue their balance sheets by withdrawing credits from those countries that had not yet demanded a rescheduling. Such action forced countries into illiquidity, and also created an incentive for likely debt problem countries to suspend payments and renegotiate their credits as soon as possible. Countries that arrived later at the debt negotiating tables found their position more difficult than had their predecessors.[34]

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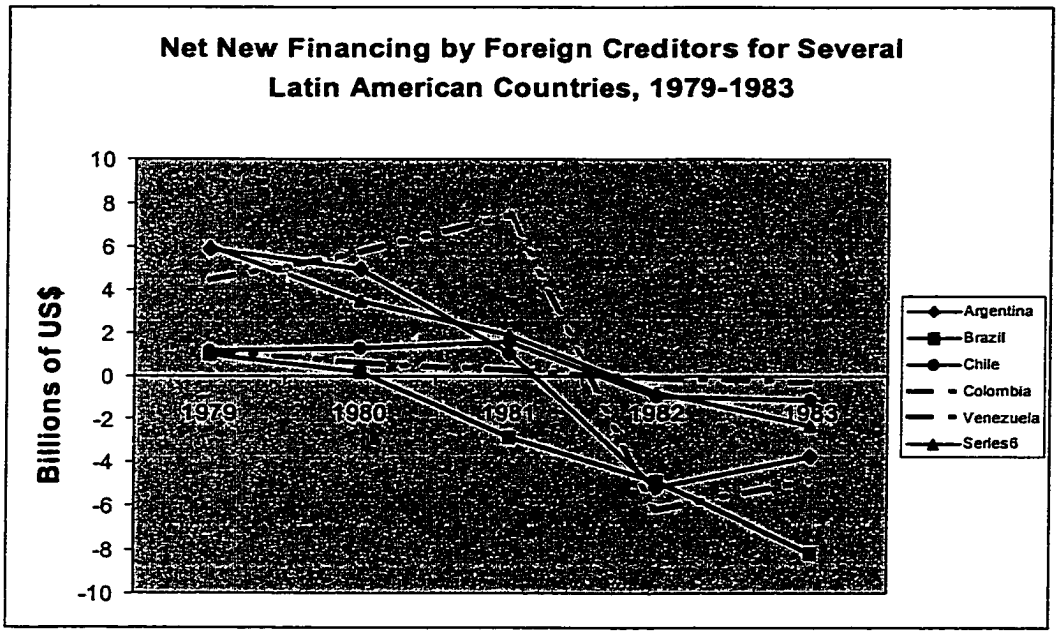
[31] *Ibid*, pp. 355-88; and Carlos F. Diaz-Alejandro, "Latin American Debt: I Don't Think We Are in Kansas Anymore," Brookings Papers on Economic Activity #2 (1984): pp. 349-56.
[32] Diaz-Alejandro, "Latin American Debt," pp. 349-56.
[33] Perhaps the best is Charles Lipson, "Bankers' Dilemmas: Private Cooperation in Rescheduling Sovereign Debts," in Kenneth Oye (ed.), *Cooperation Under Anarchy* (Princeton, NJ: 1986), pp. 200-25.
[34] James, *International Monetary Cooperation*, p. 388.

The creditor panic is well documented in the financial data from the period (Graph 1 and Graph 2).



* Bank for International Settlements, *International Banking Statistics, 1973-1983*

Graph 2

CONCLUSION

Lending to countries depends fundamentally on the *ex ante* evaluation of sovereign credibility. Countries unable to commit credibly would either be unable to borrow the maximum feasible amount of debt or face a higher cost of funds. Other than the structural considerations of national and governmental solvency, sovereign behavioral credibility is equally important. Governments become insolvent long before their respective countries. Government solvency depends largely on public policy considerations, namely ability to raise taxes or cut expenditures.

Therefore, the political constraints faced by governments would logically be an important determinant of their willingness-to-pay. Governments in unstable polities would be less likely to enact tough fiscal policies with the goal of repaying foreign creditors. Political instability also leads to policy myopia, so policies that may be good for long-term national economic prosperity may be sidelined because of political considerations. Strong democracy institutions, on the other hand, constrain government officials from undertaking arbitrary actions, and offer stronger legal and institutional protection to foreign creditors.

There has long been an assumption that past behavior is an important determinant of credibility among sovereign debtors. Consequently, the three variables hypothesized to affect sovereign credibility – past behavior, political instability, and degree of democracy – may be appropriately applied to the issue-area of sovereign bank debt. These variables are hypothesized to influence the level of credibility of a given sovereign debtor. The testable hypotheses generated from these three variables are put to the test in the following chapter.

The possibility of liquidity crises in sovereign debt creates an additional dynamic, and there is empirical evidence of just such a liquidity crisis during the debt crisis of the 1980s. It is possible that a liquidity crisis could smother credibility effects, as creditors exit in a general panic. I, therefore, will focus my empirical analysis of credibility effects in sovereign debt during the lending wave of the 1970s.

SOVEREIGN DEBT: EMPIRICAL RESULTS

This chapter presents empirical analysis of credibility effects in sovereign bank debt. The individual hypotheses concerning behavioral credibility are based on the hypotheses outlined in Chapter 3. The sample consists of developing country sovereign borrowers during the 1975-1980 lending wave. Panel econometric methods are used in the analysis.

I indicated three possible determinants of sovereign behavioral credibility in Chapter 3. In the context of sovereign debt, I expect to find that countries with bad repayment histories pay a higher risk premium *ceteris paribus*, if the hypothesis is correct. Moreover, democracies are hypothesized to be more credible than non-democracies, so democracies are expected to pay a lower risk premium *ceteris paribus*. Higher risk premium are also extracted from countries that are politically unstable *ceteris paribus*, if the hypothesis of behavioral credibility is correct.

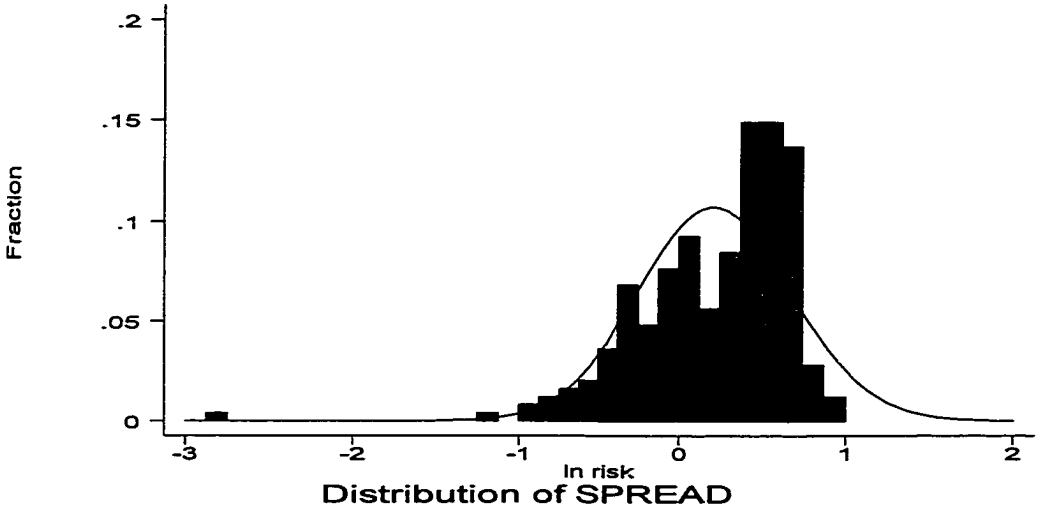
The empirical results are somewhat supportive of the credibility hypothesis. Both past behavior and democracy are found to influence the risk premium on sovereign debt in most model specifications. However, the evidence for a political instability affect is lacking. Nevertheless, the findings are encouraging, and do lend support to the overall sovereign behavioral credibility hypothesis.

DATA

The empirical analysis presented in this chapter pertains to debt data drawn from the 1975-1980 period, which encompasses the period of the lending wave of the 1970s. The focus of the analysis on a particular lending wave controls for the existence of

liquidity crises. Furthermore, the results would be stronger were it to be demonstrated that sovereign credibility was an important consideration in the minds of creditors during the height of a lending wave.

It is assumed that the world's risk-free interest rate can be approximated by LIBOR. The spread over LIBOR is further assumed to convey the default country risk premium. The *dependent variable* is the natural log of the spread above LIBOR, and the variable is termed SPREAD. The cost of borrowing no doubt includes additional elements, for instance fees and commissions, but there are no reliable data on these components of the cost. Furthermore, these additional elements were typically very small during the lending wave of the late 1970s. Consequently, the two assumptions outlined above are reasonable.[1]



Distribution of SPREAD

	Number of observations	Mean	Standard deviation	Minimum	Maximum
SPREAD	249	0.2120	0.4664	-2.8134	0.9163

[1] Sebastian Edwards, "The Pricing of Bonds and Bank Loans in International Markets: An Empirical Analysis of Developing Countries' Foreign Borrowing," *European Economic Review* 30 (June 1986): pp. 573-74.

The graph of the distribution of SPREAD reveals two important observations. First, there is an outlier to the left of the distribution, which is the spread data for Singapore in 1980. As the existence of an outlier may skew the results, the empirical analysis below omits the Singapore 1980 data point. Second, the distribution appears to be somewhat truncated on the right. There is indeed the possibility that countries that are facing particularly high spreads because of their uninspiring political and economic conditions might choose not to borrow, and therefore self-select out of the sample of sovereign borrowers. Moreover, private creditors might simply refuse to lend money to such countries even if the latter were willing to swallow the high spreads demanded because of fears about adverse selection. So truncation may bias the econometric findings.

Two related proxies are used for indicating past behavior: a dummy variable for the occurrence of at least one repayment difficulty between 1946 to 1980; and a variable specifying the number of years during that same period when defaults or reschedulings occurred. It is difficult to obtain accurate data on specific instances of defaults and reschedulings, and even harder to compare one rescheduling against another because of the vastly different amounts and circumstances involved. There is, in fact, no publicly available dataset that indicates the specific number of repayment difficulties faced by particular countries. The closest is the number of years in which defaults or reschedulings occurred. Reporting the results from two different past behavior variable would presumably strengthen my case, if the results are indeed supportive of each other.[2] If the

[2] The repayment history data is from Peter H. Lindert & Peter J. Morton, "How Sovereign Debt Has Worked," in Jeffrey D. Sachs (ed.), *Developing Country Debt and Economic Performance, Vol. I: The International Financial System* (Chicago, IL: 1989), pp. 92-7.

past behavior hypothesis is correct, then these two repayment variables should be positively correlated with the spread on loans *ceteris paribus*.

The sample covers seventy sovereign borrowers that contracted Eurocurrency credits from private banks between 1975 to 1980. The individual loan contract data covering over 1300 public and publicly-guaranteed bank loans were obtained from *Borrowings in International Capital Markets*. The data were aggregated annually with the loan amounts as weights for averaging spreads, and then pooled for the estimations. Oil exporting surplus countries and members of the Communist bloc are excluded from the analysis in order to make the countries in the dataset as comparable as possible.[3]

It should be noted that bond financing was more widespread before the 1950s, while bank lending has dominated in the postwar period. It has been argued that the yields on bonds more accurately reflect the risk of lending to developing countries than the interest rates charged in the bank loan market. The majority of scholars agree that there is a greater risk involved in bond lending. Spreads on bank loans do not reflect the true default country risk involved because of the cohesion of private bank syndicates and central bank guarantees on bank deposits in industrialized countries.[4]

Nevertheless, it is not being asserted that bank loan spreads do *not* reflect any risk. Sebastian Edwards has found that there are indeed some differences in the factors that determine the country risk premium between bonds and loans, but the price of loans still responded robustly to several of the most important factors pointed out by economic

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[3] Kuwait, Libya, Qatar, Saudi Arabia and the United Arab Emirates are consistently listed in each quarterly publication of *Borrowings in International Capital Markets* as oil-exporting surplus countries, while Oman is occasionally listed as such.

[4] See Jeffrey D. Sachs & Daniel Cohen, "LDC Borrowing with Default Risk," National Bureau of Economic Research Working Paper #925 (July 1982); and Ronald I. McKinnon, "The International Capital Market and Economic Liberalization in the LDCs," *The Developing Economies* 22 (December 1984): pp. 476-81;

theory: the debt-output ratio, investment-to-GNP ratio, and the debt service-to-exports ratio. The fact that bank loan spreads have been confirmed empirically to be related to credit risk assessments is adequate for my purposes.[5]

Table 1 provides the weighted average spreads, term and amount of Eurocurrency credits contracted by the seventy sovereign borrowers in the sample from private banks between, and including, 1975 and 1980.

Table 1: Sovereign Loans Summary, 1975-1980

Country	Weighted spread (% over LIBOR)	Number of loans	Total amount lent ($ million)	Weighted maturity (years)
Algeria	1.320	72	5070.4	7.64
Argentina	1.108	54	5909.3	8.21
Bolivia	1.776	13	560.5	6.40
Botswana	2.000	3	45	7.00
Brazil	1.442	201	17460.5	8.99
Burma	1.949	4	96.2	4.39
Cameroon	1.838	4	97	7.78
Chile	1.355	21	1671	7.94
Colombia	0.930	24	1907.9	9.50
Costa Rica	1.166	18	603.5	8.54
Cote d'Ivoire	1.658	24	817.8	8.43
Cyprus	0.767	7	210.1	7.33
Dominican Rep.	1.343	6	390.3	8.05
Ecuador	1.011	34	2167.1	8.34
Egypt	0.981	2	295.8	6.88
El Salvador	1.767	2	45	5.33
Ethiopia	1.875	1	14	10.00
Fiji	0.881	2	46	8.91
Gabon	1.819	8	387	6.81
Ghana	1.439	2	25.7	2.00
Greece	0.784	26	2824	8.45
Guatemala	1.375	1	15	8.00
Guyana	2.500	1	24	5.00
Honduras	1.056	4	73	10.00
India	0.785	8	235.7	6.63
Indonesia	1.199	31	4375.1	7.90
Iran	1.065	21	3222	7.54

[5] Edwards, "Pricing of Bonds and Bank Loans," pp. 565-89.

Ireland	0.937	9	1555.9	7.33
Jamaica	1.976	8	276	5.95
Jordan	1.075	11	540	7.20
Kenya	1.021	2	212	6.06
Korea S.	1.072	41	4126.3	8.49
Liberia	1.812	3	120	7.50
Madagascar	2.010	5	58.1	6.66
Malawi	1.668	4	111.5	7.12
Malaysia	0.878	16	2363.4	8.17
Mauritania	1.250	1	18	6.00
Mauritius	1.647	4	132	5.94
Mexico	1.009	111	20073.6	7.24
Morocco	1.209	17	2720	7.62
New Zealand	0.796	5	1140	9.60
Nicaragua	2.068	2	55	5.00
Niger	1.860	4	50	8.38
Nigeria	1.014	26	3449	7.67
Oman	1.000	2	200	6.50
Pakistan	1.970	6	187	7.07
Panama	1.505	21	1245	8.00
Papua N. Guinea	0.857	5	163.5	9.30
Paraguay	1.250	1	7	8.50
Peru	1.612	17	1144.8	5.67
Philippines	1.177	47	3808.3	8.83
Portugal	0.935	36	2209.5	7.73
Senegal	2.281	2	70	6.71
Singapore	0.219	2	100	8.00
Spain	0.947	142	8714.4	7.83
Sri Lanka	0.886	3	103.3	8.26
Sudan	2.133	2	23.5	5.00
Swaziland	1.750	1	28	7.00
Taiwan	1.082	36	2025.3	8.25
Tanzania	1.500	1	12	10.00
Thailand	0.879	18	1303.9	8.32
Trinidad	0.834	4	339	7.51
Tunisia	1.170	9	460.9	8.08
Turkey	1.574	7	1182	5.56
Uruguay	1.462	11	587.5	8.25
Venezuela	0.807	40	8227.6	7.57
Yugoslavia	1.250	62	4159.7	8.42
Zaire	1.750	1	27	4.00
Zambia	1.915	2	112.8	5.57
Zimbabwe	1.200	2	28.6	5.00
All 70 countries				
	1.132	**1343**	**$122,060.3**	**7.92**

There appears roughly to be little evidence of capital rationing on the part of private banks for pre-WWII defaults. The largest sovereign borrower in the sample in terms of total debt contracted is Mexico (US$ 20,074 million) followed by Brazil (US$ 17,460 million) and Venezuela (US$ 8,228 million). Mexico has a history of default on pre-1940 loans. Brazil and Venezuela, on the other hand, have bad pre-1940 and post-1940 records.

Arguably, the single most important economic variable used in studies of sovereign debt is the total debt-GNP (DODGNP) ratio.[6] It is included as one of the explanatory variables in the models presented below to demonstrate structural credibility effects. It is also lagged by one year so as to sidestep potential endogeneity problems.

As discussed in the prior chapters, the two political determinants of behavioral credibility are democracy and political instability. The proxy for degree of democracy is a dummy variable with 1 for democracy and 0 otherwise. It is calculated from the freedom index, which is the average of the annual political rights and civil liberties scores published by *Freedom House*. To recapitulate, degree of democracy appears to be correlated with lower levels of corruption only for countries with freedom index scores of 2 or less. Corruption is used as a proxy for transparency. Consequently, countries with freedom index scores of 2 or less are labeled 1, and those with higher scores are labeled 0. If the credibility hypothesis is correct in that democracies are seen as more credible than non-democracies, then I expect to see a negative relationship between the spread on loans and the democracy dummy.

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[6] These are variables that have been used extensively in studies of developing country debt. For a discussion of the variables, see Edwards, "Pricing of Bonds and Bank Loans," pp. 571-73; Barry Eichengreen, "Historical Research on International Lending and Debt," *Journal of Economic Perspectives*

The accurate measurement of political instability is an enduring problem. To try to counter this problem, I estimate political instability using two methods. The first method is to estimate an annual political instability score through likelihood maximization of the likelihood of an assumed normal distribution. A four-year average political instability score is constructed from the average political instability scores of the preceding four years. The score may be taken as a measure of domestic general political volatility and instability. Data for political events used in the political instability score estimate are taken from the *Cross-National Time-Series Data Archive* (CNTS) founded by Arthur Banks covering the years 1970 to 1980. The various political events variables included in the maximum likelihood model are coups, effective executive changes, strikes, riots, revolts and demonstrations. The estimates are based on a much larger sample of developing countries than those in the sovereign loan sample.

After several analyses with different variables, the final annual political instability index is constructed from the following

$$polins = a*coups + b*executive\ \ changes + c*strikes + d*riots + e*revolts + f*demonstrations$$

with the constraint $a+b+c+d+e+f=1$

Under the assumption that the political instability scores are normally distributed with mean μ and standard deviation σ; the likelihood for each observation would be

$$f(instability\ \ score, \mu, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} * e^{-\frac{1}{2}\left(\frac{polins_i - \mu}{\sigma}\right)^2}$$

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5 (Spring 1991): pp. 160-62; and Barry Eichengreen & Richard Portes, "Debt and Default in the 1930's: Causes and Consequences," *European Economic Review 30* (June 1986): pp. 599-640.

The likelihood function for the full sample would be the product of the individual likelihood functions. If we take the logarithm and drop the constant terms, we obtain the likelihood function

$$\ln L = -n\ln(\sigma) - \frac{1}{2}\sum_{i=1}^{n}\left(\frac{polins_i - \mu}{\sigma}\right)^2$$

We then maximize this likelihood by choosing a, b, c, d, e, and f subject to the following contraints:

$$a+b+c+d+e+f=1$$

$$\sigma \geq 0$$

The solution to the constrained optimization turns out the following estimates:

a	b	c	d	e	f	μ	σ
0.9641	-0.0019	0.0647	-0.0074	-0.0299	0.0103	0.0474	0.2027

The annual score for each country is calculated thus

```
Political instability score = 0.9641*coups - 0.0019*executive changes +
0.0647*strikes - 0.0074*riots - 0.0299*revolts + 0.0103*demonstrations
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The sample mean is 0.0474 with a standard deviation of 0.2027.

The second, perhaps better, method is to estimate the probability of an imminent change in the chief executive of country *i* at year *t* by using the random effects probit procedure

$$y_{it}^{*} = X_{it}\beta + \varepsilon_{it}$$

where $i = 1, 2, \ldots, n$ and $t = 1, 2, \ldots, T$. Observations on y_{it}^{*} are obviously not available. Instead I have data that distinguish only whether individual observations are in one category or a second category. In terms of data on executive change that is observable,

the dependent variable is a binary variable with 1 for at least one incidence of a change in the executive, and 0 otherwise

$$y_{it} = 1 \quad \text{if} \quad y_{it}^{*} > 0$$
$$y_{it} = 0 \quad \text{if} \quad \text{otherwise}$$

The error term (ε_{it}) is decomposed into

$$\varepsilon_{it} = \alpha_i + \eta_{it}$$

which is correlated within the cross-sectional units across time, but not across different units. The correlation of the error terms within the cross-sectional units (ρ) can be tested to determine if the panel estimation approach is appropriate for the data, or a simple probit regression would be adequate. The individual random effects (α_i) are treated as random variables following a normal distribution

$$\alpha_i \sim N(0, \sigma_\alpha^2)$$
$$\eta_{it} \sim N(0, \sigma_\eta^2)$$
$$E(\alpha_i \eta_{it}) = 0$$
$$E(\alpha_i \alpha_j) = 0, \quad \text{for} \quad i \neq j$$

The individual random effects are also assumed to be independent of the explanatory variables (X_{it}). This approach uses a larger array of explanatory variables to estimate the probability of a change in the executive: riots, revolts (indicating successful coups and attempted coups), coups, cabinet changes, legislative elections, lagged cabinet changes, lagged executive changes, democracy, log of lagged consumer price inflation, and log of per capita income. The political events data is again from the *Banks* dataset, and covers the years 1972 to 1980. The economic data is from the *World Development Indicators* dataset compiled by the World Bank.

The probit model assumes that y_{it} has a standard normal distribution with mean 0 and unit variance. For the joint probability of y_i given α_i and X_i, we have

$$P(y_i \mid \alpha_i, X_i) = \prod_{t=1}^{T} \Phi(X_{it}\beta + \alpha_i)^{y_{it}} \cdot [1 - \Phi(X_{it}\beta + \alpha_i)^{1-y_{it}} \quad .$$

For the joint probability of y_i given X_i, we have

$$P(y_i \mid X_i) = \prod_{t=1}^{T} \Phi(X_{it}\beta + \sigma_\alpha^2 \tilde{\alpha}_i)^{y_{it}} \cdot [1 - \Phi(X_{it}\beta + \sigma_\alpha^2 \tilde{\alpha}_i)^{1-y_{it}} \cdot \phi(\tilde{\alpha}_i) d\tilde{\alpha}_i$$

where $\alpha_i = \sigma_\alpha \tilde{\alpha}_i$. Φ denotes the cumulative probability function of the standard normal distribution, while ϕ denotes the density function. The second joint probability replaces the probability function of y_i conditional on α_i by a probability function that is marginal with respect to α_i. Maximizing the log likelihood of $P(y_i \mid X_i)$ will generate consistent estimators for β and σ_α^2 in the limit. The specific calculations are quite involved, and interested readers are asked to refer to the footnotes for further reading.[7]

Table 2: Random Effects Probit Results for Change in Executive*

	Model 1	Model 2	Model 3
External War	-0.1535 (0.3658)		
Assassinations	-0.0382 (0.0563)	-0.0349 (0.0556)	
Riots	0.1170** (0.0573)	0.1016* (0.0574)	0.0853** (0.0377)
Demonstrations	-0.0696 (0.0658)	-0.0506 (0.0654)	
General strikes	0.0783 (0.1748)	0.0821 (0.1758)	

[7] James J. Heckman & Robert J. Willis, "Estimation of a Stochastic Model of Reproduction: An Econometric Approach," in Nestor E. Terleckyj (ed.), *Household Production and Consumption* (NY: 1976), pp. 99-138; J. S. Butler & Robert Moffitt, "A Computationally Efficient Quadrature Procedure for the One-Factor Multinomial Probit Model," *Econometrica* 50 (May 1982): pp. 761-64.

Guerrilla attacks	0.2430 (0.1894)	0.2363 (0.1864)	
Revolts	0.4944** (0.2184)	0.5303** (0.2094)	0.5422** (0.2015)
Coups	3.8989** (0.8172)	4.1757** (0.8002)	4.1804** (0.8016)
Cabinet changes	1.2835** (0.2043)	1.3776** (0.1891)	1.3869** (0.1905)
Legislative elections	0.6679** (0.1966)	0.6892** (0.1844)	0.6949** (0.1844)
Lagged cabinet changes	-0.3958* (0.2107)	-0.4349** (0.2021)	-0.4549** (0.2013)
Lagged executive changes	0.61561** (0.2761)	0.6384** (0.2418)	0.6399** (0.2413)
Democracy	0.4471** (0.2193)	0.6103** (0.2109)	0.5622** (0.2082)
Log of per capita GNP	0.3034** (0.1050)	0.3187** (0.0920)	0.3214** (0.0928)
Log of lagged inflation	0.1118 (0.01089)		
n	84	106	106
n*T	684	852	852
Wald χ^2 test of all $\beta = 0$	93.37	110.54	109.89
Likelihood ratio test, $\chi^2(1)$ (H_o : ρ=0)	1.32	3.37	3.88

* Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

After various combinations of explanatory variables, I settle on Model 3 as the final model for estimating the probability of an imminent executive change. The test for ρ results in a $\chi^2(1)$ value that is marginally significant with a p-value of 4.9%. To obtain the final in-sample probability estimates, three related probit models were run. The probability estimates for the years 1975 and 1976 are based on running the random effects probit model up to 1976. Then estimates for the years 1977 and 1978 are obtained by estimating the model up to 1978. The estimates for the remaining two years are derived from the parameter estimates of Model 3 above (using data from all nine years).

To obtain the probability estimates, I apply the inverse of the cumulative standard normal function to the index represented by the sum of the estimated coefficients multiplied by the corresponding variable values for each observation. The resulting probabilities are interpreted as an estimate of the conditional probability that a country will experience a change of its chief executive given its respective values for X_i. Hence, for countries in years 1979 and 1980, for example, the calculation would follow

$$\text{Probability of executive change} = \Phi^{-1}[\text{constant} + 0.0853*\text{riots} + 0.5422*\text{revolts} + 4.1804*\text{coups} + 1.3869*(\text{cabinet changes}) + 0.6949*(\text{legislative elections}) - 0.4549*(\text{lagged cabinet changes}) + 0.6399*(\text{lagged executive changes}) + 0.5622*\text{democracy} + 0.3214*(\ln \text{per capita GNP})]$$

where Φ^{-1} denotes the inverse of the cumulative probability function of the standard normal distribution.

Table 3: Random Effects Probit Results for Change in Executive for Different Periods*

	1972-1976 Model	1972-1978 Model
Riots	0.2090**	0.0364
	(0.1032)	(0.0505)
Revolts	0.3857	0.6098**
	(0.3927)	(0.2701)
Coups	5.3459**	4.1544**
	(1.5532)	(0.9303)
Cabinet changes	2.6751**	1.5562**
	(0.6551)	(0.2733)
Legislative elections	0.8329**	0.7349**
	(0.3835)	(0.2255)
Lagged cabinet changes	-0.7195**	-0.2928
	(0.3650)	(0.2454)
Lagged executive changes	1.0410**	0.5100*
	(0.4082)	(0.3045)

Democracy	0.5025 (0.3716)	0.2309 (0.2561)
Log of per capita GNP	0.6326** (0.1910)	0.4260** (0.1188)
n n*T	96 447	99 645
Wald χ^2 test of all $\beta = 0$	27.16	63.25
Likelihood ratio test, $\chi^2(1)$ (H_0 : ρ=0)	1.68	2.77

* Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

It appears that some of the coefficient estimates do change over time. The coefficient for the democracy dummy, for example, is not statistically significant for estimates up to year 1978. Consequently, running three time-consecutive models to estimate the in-sample probability of executive change is justified. The probability of executive change is used in the regressions below as an explanatory variable.

EMPIRICAL ANALYSIS

The debt model utilized follows the convention used in past studies.[8] The cost of foreign funds is assumed to be formed by two elements: (1) the exogenous risk-free world interest rate (i), and (2) a country-risk premium (s) related to the probability of default or rescheduling as perceived by the lender (p). The equilibrium condition for a risk-neutral lender is given by

$$(1-p)[1+(i+s)] = (1+i)$$

The country risk premium can consequently be written as

$$s = [p/(1-p)]k$$

where $k = (1 + i)$. The functional form of p is assumed to be logistic, and the equation becomes

$$\log s = \log k + X_i \beta_i + \eta$$

where the X_i are the determinants of p, the β are the corresponding coefficients and η is a random error term.

I will use different panel data econometric methods to capture the dynamics of sovereign lending because the correct econometric model is unknown. Results from two different models are presented: random effects and fixed effects. The chief differences in assumption between the two approaches are

Random effects model: individual effects (α_i) are uncorrelated with X_{it}

Fixed effects model: individual effects (D_i) are correlated with X_{it}

The justification for panel data econometric approaches is that the OLS estimator on pooled cross-section and time-series data weighs each observation equally. However, there is not quite so much information in n cross-section units each observed T times as there is in $n*T$ independent cross-section units. An additional observation on an individual or country already in the data set is unlikely to add as much information as an additional observation from a wholly new individual or country.[9]

The individual effects from both models and time-specific dummies are capturing $\log k = \log (1 + i)$. Country-specific effects for sovereign debt may be such factors as geography, strategic ties with creditor countries, domestic legal tradition, historical ties

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[8] See Edwards, "Pricing of Bonds and Bank Loans,"; and Sule Özler, "Have Commercial Banks Ignored History?," *American Economic Review* 83 (June 1993): pp. 608-20.

[9] The standard references on panel data estimation are Badi H. Baltagi, *Econometric Analysis of Panel Data* (NY: 1995); Cheng Hsiao, *Analysis of Panel Data* (NY: 1986); and Gary Chamberlain, "Panel Data,"

with creditor banks, domestic political institutions, and the like. The question is whether these effects are correlated with both the dependent variable and the behavioral credibility variables.

The general explanation given for the random effects probit model above serves equally well for the random effects linear model, except that the dependent variable in the latter is a continuous variable, and hence there is no need to derive joint probabilities or log likelihoods

$$y_{it} = X_{it}\beta + \alpha_i + \eta_{it}$$

To distinguish it from the fixed effects approach, the random effects approach specifies that the individual effects term (α_i) is a unit-specific disturbance term that enters the regression identically in each time period for the respective cross-section units. The random disturbance term (η_{it}), however, enters the regression in each time period differently. The OLS estimator fails to utilize information about the heteroscedasticity that is caused by using repeated observations of the same cross-section units. The heteroscedasticity means that the random effects estimator is calculated through generalized least squares (GLS). If indeed the variance of the individual component is zero ($\sigma_\alpha^2 = 0$), then the model can just as well be estimated through OLS without the need for any individual effects term

$$y_{it} = X_{it}\beta + \eta_{it} \quad \text{if} \quad \alpha_i : N(0,0)$$

The random effects model used in this study includes time specific dummies

$$y_{it} = X_{it}\beta + \gamma_t + \alpha_i + \eta_{it}$$

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in Zvi Griliches & Michael D. Intriligator, *Handbook of Econometrics, Vol. 2* (Amsterdam, Holland: 1984), pp. 1247-1318.

where γ_t represents the *T-1* dummy variables representing each year in the data.[10]

The fixed effects model has become very popular among econometricians chiefly because of its promise of eliminating omitted variable bias (OVB) caused by the omission of relevant time-invariant regressors. The fixed effects model holds this wonderful promise because it is the same as having different intercepts for each cross-section unit

$$y_{it} = X_{it}\beta + D_i + \eta_{it}$$

where D_i, which is the individual effects term in this case, is a set of n dummy variables that are taken to be constant over time t and specific to the individual cross-sectional unit *i*. Unlike the random effects model, the individual effects term (D_i) is neither treated as a random variable nor assumed to be independent of the explanatory variables (X_{it}). In fact, the fixed effects estimator is best used when the explanatory variables are not expected to be independent of omitted time-invariant regressors.

When the parameters for the model are estimated, the time-invariant fixed effects are purged from the data.

$$y_{it} - \overline{y_i} = (X_{it} - \overline{X_i})\beta + (D_i - \overline{D_i}) + (\eta_{it} - \overline{\eta_i})$$

$$y_{it} - \overline{y_i} = (X_{it} - \overline{X_i})\beta + (\eta_{it} - \overline{\eta_i})$$

For this reason, the fixed effects estimator is also called the *within group estimator* as it uses only the variation within a specific unit's group observations over time. Intuitively, we are using the cross-section units as their own controls. This naturally eliminates OVB

[10] For a discussion of random effects estimation, see Pietro Balestra & Marc Nerlove, "Pooling Cross-Section and Time Series Data in the Estimation of a Dynamic Model: The Demand for Natural Gas," *Econometrica* 34 (July 1966): pp. 585-612; and G. S. Maddala, "The Use of Variance Components Models in Pooling Cross Section and Time Series Data," *Econometrica* 39 (March 1971): pp. 341-58;

caused by time-invariant regressors that are either too intangible to be measured or too numerous to be included in the regression. The fixed effects model used in this study also includes time-specific effects,

$$y_{it} = X_{it}\beta + D_i + \gamma_t + \eta_{it}$$

like the random effects model above.

There are various arguments for choosing one panel data model over the other. If one seeks to make inferences only about the set of cross-section units in the sample, then we should treat the individual effects as fixed. However, one should treat the individual effects as random if there is a need to make inferences about a larger population from which the sample was selected. Some scholars have argued that we should treat the individual effects as a random variable because we are ignorant about them in the same way as we are ignorant about the error term, which we invariably treat as a random variable.[11]

Moreover, if there is a large number of cross-section units, a lot of degrees of freedom would have to be sacrificed because of the need to estimate N parameters (different intercepts for each cross-section unit) when following the fixed effects approach. In the random effects case, on the other hand, we need to estimate only the mean and variance of the individual effects as a single random variable. Nevertheless, the virtue of the fixed effects model in reducing OVB from relevant time-invariant regressors has considerable merit. The fixed effects linear procedure will also produce consistent estimates of the identifiable parameters even when the random effects linear procedure is valid. Many researchers have a preference for fixed effects over random effects because it

in unlikely that the individual effects are uncorrelated with the explanatory variables in the regression, except in experimental or quasi-experimental situations. It is best, however, to use both models unless there is an *a priori* reason to prefer one model over the other, and if the results from one approach are confirmed by the other, then the conclusion would be much more robust.

In the interest of obtaining clear results and scientific parsimony, the regressions contain only four explanatory variables of interest (other than the individual effects and time-specific dummies): the debt-to-GNP ratio, one of the two past behavior variables, the democracy dummy, and one of the two political instability variables. Moreover, there is little *a priori* reason to suppose that any of the behavioral credibility variables would be correlated with other structural credibility variables such as the investment-to-GDP ratio or the debt service-to-exports ratio such that these structural variables should be included as controls. There are four regression equations for each panel data model used.

I begin with the random effects model. All the coefficients have the expected signs, except the coefficient for the probability of executive change, which is not statistically significant. The debt-to-GNP ratio and democracy dummy coefficients are statistically significant at the 95 percent confidence level for all four equations of the random effects model. Three of the four repayment variable coefficients are also statistically significant, though at the 90 percent confidence level. The reported coefficients are jointly significant at the 95 percent confidence level according to the Wald-statistics for each regression equation. The three behavioral credibility coefficients are also jointly significant at the 5 percent significance level for all equations.

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[11] See Yair Mundlak, "On the Pooling of Time Series and Cross Sectional Data," *Econometrica* 46 (January 1978): pp. 69-86; and Maddala, "Variance Components Models," pp. 341-58;

Table 4: Random Effects Regression Results*

Dependent variable is SPREAD

	Equation 1	Equation 2	Equation 3	Equation 4
Debt-to-GNP ratio	0.0059** (0.0013)	0.0062** (0.0013)	0.0063** (0.0014)	0.0065** (0.0014)
Repayment difficulty dummy	0.1339* (0.0742)		0.1396* (0.0750)	
Number of years where repayment problems occurred		0.0349 (0.0216)		0.0376* (0.0268)
Democracy dummy	-0.1682** (0.0565)	-0.1631** (0.0567)	-0.1661** (0.0563)	-0.1610** (0.0565)
General political instability score	0.1170 (0.1992)	0.1184 (0.1996)		
Probability of executive change			-0.0496 (0.0530)	-0.0532 (0.0527)
n*T	245	245	233	233
n	70	70	67	67
R-squared	0.5191	0.5064	0.5251	0.5105
Wald-statistic on coefficients presented	34.55	33.56	37.62	36.49
Wald-statistic on 3 behavioral credibility coefficients	12.82	11.86	13.15	12.13

* Time specific effects are unreported. Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

The fixed effects regression coefficients are reported with robust standard errors. All the coefficients have the expected signs, except again the coefficient for the probability of executive change, which is also not statistically significant. The debt-to-GNP ratio and repayment variable coefficients are statistically significant at the 95 percent confidence level for all four equations of the fixed effects model. Two of the four coefficients of the democracy dummy, specifically the ones in the regression equation with the repayment dummy, are statistically significant at the 10 percent significance

level. The other two democracy dummy coefficients are only marginally outside the 1.645 t-statistic bound. Truth be told, all four democracy dummy coefficients are spread around the 10 percent significance mark, and may generally be considered to be marginally significant.

Table 5: Fixed Effects Regression Results*

Dependent variable is SPREAD

	Equation 1	Equation 2	Equation 3	Equation 4
Debt-to-GNP ratio	0.0070**	0.0062**	0.0074**	0.0067**
	(0.0018)	(0.0019)	(0.0018)	(0.0019)
Repayment difficulty dummy	0.3975**		0.3998**	
	(0.0584)		(0.0575)	
Number of years where repayment problems occurred		0.2618**		0.2637**
		(0.0678)		(0.0693)
Democracy dummy	-0.1238*	-0.0972	-0.1248*	-0.0979
	(0.0724)	(0.0615)	(0.0731)	(0.0620)
General political instability score	0.2403	0.2397		
	(0.2509)	(0.2664)		
Probability of executive change			-0.0377	-0.0285
			(0.0566)	(0.0551)
n*T	245	245	233	233
n	70	70	67	67
R-squared	0.8904	0.8981	0.8922	0.9003
F-statistic on coefficients presented	21.99	6.67	23.09	6.98
F-statistic on 3 behavioral credibility coefficients	17.98	5.84	18.71	5.66

* Country-specific and time-specific effects are unreported. Robust standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

The R-squared for fixed effects models are naturally higher because of the inclusion of what are essentially dummy variables for each cross-section unit. In this case, there are about seventy such groups corresponding to the number of sovereign

borrowers in the sample. All the reported coefficients are jointly significant at the 5 percent significance level according to the F-statistics for each regression equation. The three behavioral credibility coefficients are also jointly significant at the 95 percent confidence level for all equations.

Of the coefficients that are statistically significant across both models, the coefficients for the repayment variables in the fixed effects model are much larger in magnitude than those in the random effects model. The coefficients for the democracy dummy are also slightly larger in magnitude in the fixed effects results, compared to those estimated through random effects. This indicates that there may be OVB in the random effects model that exerts a downward bias on the coefficients of the repayment variables and democracy dummy. Furthermore, the democracy variable in the fixed effects model loses the high level of statistical significance it enjoys in the random effects case. This may be caused by a loss of reliability in measuring democratic practice and institutions in the indicator of democracy from *Freedom House* after controlling for time-invariant effects such as political culture and institutions. Perhaps the strength of democracy comes largely from the strength of long-standing institutions and traditions, which are all intangible variables that are almost impossible to measure but controllable through the fixed effects approach. The coefficients for the debt-to-GNP ratio, on the other hand, are relatively stable across both models.

Both political instability measures are not statistically significant in either model. There is the possibility that both measures are flawed. However, it is unlikely to be a measurement or estimation mistake when two different measures both fail to produce the expected result. If the political instability measures were reasonably constructed and

relatively reliable indicators of the phenomenon they purport to estimate, then I can only conclude that the hypothesis of political instability as a determinant of sovereign credibility in sovereign debt relationships is not supported. Perhaps foreign creditors care more about past behavior and democratic practices than political instability.

The regression results presented above strongly infer that some behavioral credibility elements did influence credit terms during the lending wave of the 1970s, though no credit rationing seems to have been instituted against bad borrowers. The general findings are confirmed by both panel data procedures for most of the regression equations. Sovereign borrowers with bad repayment records and lacking in democracy were charged higher risk premium in general. Two of the three hypotheses derived from sovereign behavioral credibility are supported by the empirical analysis.

TRUNCATION

As mentioned earlier, one problem with the analysis above is that the data may be truncated. Truncation occurs when observations above and/or below certain points are simply unavailable for whatever reason. It results in a distribution that does not integrate to 1. In terms of regression, truncation causes the expectation of the error term to not be 0, and thus biases the parameter estimates. The explanation starts with the standard formulation of the relationship between a dependent variable and the explanatory variables

$$y_i = X_i\beta + \varepsilon_i$$

where $\varepsilon_i \sim N(0, \sigma^2)$. Suppose that for whatever reason, some observations that would otherwise be in the sample have been eliminated. In particular, observations above a

certain value of y_i are more likely to not be in the sample. In such a situation, a regression of the remaining data points will underestimate the relationship between y_i and X_i. Instead of

$$E(y_i \mid X_i) = X_i\beta + E(\varepsilon_i) = X_i\beta$$

we have

$$E(y_i \mid X_i) = X_i\beta + E(\varepsilon_i \mid y_i \text{ observed})$$

where $E(\varepsilon_i \mid y_i \text{ observed})$ is patently not 0. The selection bias induces a correlation between the disturbance term and the explanatory variables.

The density function of the truncated normal distribution, which is truncated at the point c that is located above the mean, from which the samples are drawn is

$$f(y^* \mid y^* < c) = \frac{1}{\sigma}\phi\left(\frac{y^* - \mu}{\sigma}\right) \div \Phi\left(\frac{c - \mu}{\sigma}\right)$$

where $(-\infty < y^* \leq c)$. The term $\Phi[(c-\mu)/\sigma]$ is the normalizing constant because it is used to scale the density so that it integrates to 1 over the range below c. In general, the moments of a truncated normal distribution with mean μ and variance σ^2 are

$$E(y \mid truncation) = \mu + \sigma\lambda(\varphi)$$
$$Var(y \mid truncation) = \sigma^2[1 - \delta(\varphi)]$$

where $\varphi = (c-\mu)/\sigma$ and $\delta(\varphi) = \lambda(\varphi)[\lambda(\varphi) - \varphi]$. If truncation is y > c (meaning the truncation point is below the mean), then

$$\lambda(\varphi) = \frac{\phi(\varphi)}{[1 - \Phi(\varphi)]}$$

but if truncation is y < c (meaning the truncation point is above the mean), then

$$\lambda(\varphi) = \frac{-\phi(\varphi)}{\Phi(\varphi)}$$

The function $\lambda(\varphi)$ is called the inverse Mills ratio.

There are two techniques to deal with truncation: a two-step regression procedure and a maximum likelihood estimation procedure. Using the maximum likelihood procedure, we take the log likelihood of the density function of y^*:

$$\ln L = -\frac{n}{2}[\ln(2\pi) + \ln\sigma^2] - \frac{1}{2\sigma^2}\sum_{i=1}^{n}(y_i - \mu)^2 - \sum_{i=1}^{n}\ln\left[\Phi\left(\frac{c-\mu}{\sigma}\right)\right]$$

where μ would be $X_i\beta$ in regression. The log likelihood is then maximized to obtain consistent estimates of the parameters.[12]

The calculation is highly complicated, and more so in the case of panel data. Consequently, I will first perform estimation on a simple pooled linear regression model to see if there are indeed signs of truncation bias on the coefficients. The model that is used is $y_i = X_i\beta + \gamma_t + \varepsilon_i$, which is merely OLS with time-specific dummies (γ_t). The results are presented below. The pooled regression results are listed until "Regression," while the maximum likelihood Heckman selection results are listed under "Heckman." There appears to be no significant truncation bias. The coefficients and standard errors are similar across the pooled OLS regression and truncation-corrected maximum likelihood procedures. Therefore, I conclude that there is little to no truncation bias, and will not proceed to perform the estimation with panel data regression models.

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[12] For a discussion of truncation-corrected models, see James J. Heckman, "The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator for Such Models," *Annals of Economic and Social Measurement* 5 (Fall 1976): pp. 475-92; Jerry A. Hausman & David Wise, "Social Experimentation, Truncated Distributions, and Efficient Estimation," *Econometrica* 45 (May 1977): pp. 919-38; Jerry Hausman & David Wise, "Attrition Bias in Experimental and Panel Data: The Gary Income Maintenance Experiment," *Econometrica* 47 (March 1979): pp. 455-73;

Table 6: Regression and Heckman Maximum Likelihood Results*

	Dependent variable is SPREAD			
	Regression 1	Heckman 1	Regression 2	Heckman 2
Debt-to-GNP ratio	0.0054**	0.0055**	0.0055**	0.0056**
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Repayment difficulty dummy	0.0654	0.0610		
	(0.0433)	(0.0432)		
Number of years where repayment problems occurred			0.0039	0.0035
			(0.0118)	(0.0117)
Democracy dummy	-0.2204**	-0.2153**	-0.2230**	-0.2173**
	(0.0506)	(0.0498)	(0.0509)	(0.0501)
Probability of executive change	-0.0416	-0.0341	-0.0437	-0.0352
	(0.0717)	(0.0706)	(0.0721)	(0.0710)
Number of observations	233	472	233	472
Truncated observations		244		243
R-squared	0.5334		0.5289	
Log likelihood		-40.2489		-41.1948

* Time-specific coefficients are unreported. Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

CONCLUSION

Debt theory offers theoretical support to the role of credibility in international credit relationships. In practical terms, I expect to find that a sovereign borrower with lower credibility will be charged higher spreads and/or suffer from credit rationing on average. The one factor in sovereign credibility that has received the most attention is past behavior, with political instability playing a supporting role. However, most empirical studies on past behavior and sovereign debt have generally found no robust relationship between them.

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and G. S. Maddala, "Limited Dependent Variable Models Using Panel Data," *Journal of Human Resources*

The cyclical nature of international lending provides a possible explanation for the puzzle. The past empirical studies largely focused on periods of lending stagnation when *all* borrowers suffered from a general retreat by lenders from the international capital market. The collective action problem of numerous small creditors, each with increasing marginal cost of funds, may have predominated for many years following debt crises. The effect of credibility might emerge clearer during periods of lending expansion.

The empirical findings in this study support the hypothesis that sovereign behavioral credibility did influence the risk premium on sovereign loans during the late 1970s. In particular, I found that past behavior and democracy are significant determinants of loan spreads. It lends support to the hypothesis of the existence of behavioral credibility considerations in international credit relationships during lending waves.

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22 (Summer 1987): pp. 307-38.

FOREIGN DIRECT INVESTMENT: THEORY AND HISTORY

Foreign direct investment (FDI) is another issue-area where credibility would be important intuitively. Like sovereign debt, foreign companies cannot appeal to an overarching global authority for redress when their investments are expropriated, except for cases where bilateral treaties exist to protect the investments. Consequently, multinational corporations (MNCs) looking to invest in a foreign country should be acutely concerned about the credibility of the host country in terms of the political risks involved.

I will examine the theory and history relating to sovereign credibility in FDI, particularly in the petroleum industry, in this chapter. The general framework is similar to that encountered in sovereign debt. The lack of a global enforcement mechanism means sovereign commitments must be assessed largely on the basis of the credibility of the country making the commitment. Moreover, it can be clearly demonstrated that the lack of a commitment mechanism in FDI will restrict capital flows into a given country, as I will discuss below. Again, I hypothesize that the three variables of past behavior, political instability, and degree of democracy affect the level of sovereign behavioral credibility of a given host country. There have been some theoretical models defining reputation effects in FDI, but empirical examinations of the theory are even more lacking than in sovereign debt.

MNCs invest in foreign countries for a variety of reasons. The most important drivers of FDI include lower cost of production in the host country, host country domestic market access, availability of needed raw materials, and circumvention of tariff

barriers and other impediments to trade. Obviously, an MNC undertakes FDI in a particular country because it expects to either obtain larger benefits or pay lower costs compared with the best alternative. Most FDI occurs between industrialized countries, and there are more institutional mechanisms protecting foreign investors among these countries. Consequently, fears of expropriation are more endemic to investments in developing countries.

A high probability of expropriation would compel foreign investors to keep their funds at home, and there would be no FDI flows, which is obviously not the case in reality. FDI flows to developing countries are in the magnitude of billions of dollars annually, and growing. Although there is no international institution or authority that enforces the property rights of foreign investors, the invisible effects of credibility are present. Host countries must be able to convince foreign investors that they are committed to honor their contractual obligations before they are able to attract investments. The strength of these commitments depends on structural and behavioral credibility.[1]

The population of energy companies that invest overseas as majority-owners is relatively small, and the population of petroleum-exporting countries is even smaller. The environmental conditions of frequent and repeated interaction, indefinite horizon of interaction, and transparent past behavior can again be assumed. In such a milieu, foreign investors should logically pursue self-policing behavior, and punish countries that have expropriated foreign-owned assets in the past. Moreover, domestic political instability and degree of democracy should be important considerations in assessing the level of

sovereign behavioral credibility as they affect a government's discount rate and payoffs. The specific hypotheses regarding sovereign credibility are tested in the following chapter.

FOREIGN DIRECT INVESTMENT

FDI was traditionally associated with direct control of an enterprise by a person or group domiciled in a foreign country. This concept is now generally accepted as outmoded. Both the IMF and OECD have come to adopt a vaguer definition of FDI:

> Foreign direct investment reflects the objective of obtaining a lasting interest by a resident entity in one country ('direct investor') in an entity resident in an economy other than that of the investor ('direct investment enterprise'). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise.

To ensure an adequately " significant degree of influence," the OECD recommends a 10 percent or more ownership stake in the foreign enterprise by the investor.[2] FDI is distinguished from portfolio investment, which generally encompasses equities, debt securities, money market instruments, and financial derivatives.

FDI exerts both positive and negative effects, though most commentators believe the positive effects outweigh the negative effects decisively. Inflows of foreign capital into developing countries permit faster growth with less sacrifice of current consumption than would otherwise occur. Capital inflows also smooth economic cycles when capital formation sprints further ahead of slower growing domestic savings rates. Countries with high savings benefit by being able to invest capital overseas where the returns are much

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[1] Jonathan Eaton & Mark Gersovitz, "Country Risk: Economic Aspects," in Richard J. Herring (ed.), *Managing International Risk: Essays in Honor of the Centenary of the Wharton School, University of Pennsylvania* (NY: 1983), pp. 79-80.

[2] In OECD, *OECD Benchmark Definition of Foreign Direct Investment*, 3rd edition (Paris: 1996), pp. 7-8.

higher. Most importantly, FDI are usually associated with the transfer of advanced management practices and technology to the host country.[3]

It is important to note that most FDI originate and end among the industrialized countries, largely into the European Union (EU) and the United States. About three-quarters of the present global stock of direct investment are located in developed countries. The reasons for this lopsided development include the fact that economic opportunities are greater and more lucrative in developed country markets, and the rights of foreign investors are also more secure in these countries. Other than domestic legal codes protecting foreign-owned assets from arbitrary confiscation, there are also multilateral agreements cementing the rights of foreign investors among the developed countries. The EU and the Organization on Economic Cooperation and Development (OECD), for example, have guidelines and rules for their member states with respect to treatment of foreign investment.[4]

TYPES OF EXPROPRIATIONS

Expropriation refers to the involuntary deprivation or forced divestment of foreign direct investment property. Forced deprivation of property owned by permanent expatriate residents is excluded.[5] The terms "expropriation" and "nationalization" are

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[3] Ronald Findlay, "Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model," *Quarterly Journal of Economics* 92 (February 1978): pp. 1-16; and Jian-Ye Wang, "Growth, Technology Transfer, and the Long-Run Theory of International Capital Movements," *Journal of International Economics* 29 (November 1990): pp. 255-71.

[4] Robert C. Feenstra, "Facts and Fallacies about Foreign Direct Investment," in Martin Feldstein (ed.), *International Capital Flows* (Chicago, IL: 1999), pp. 332-33; and Robert E. Lipsey, "The Role of Foreign Direct Investment in International Capital Flows," in Feldstein, *International Capital Flows*, pp. 317-18.

[5] There are four major types of expropriations:

1) *Formal Expropriation* – The confiscation of foreign property directly by the government under the due process of local law.
2) *Intervention* – The extra-legal forced transfer of ownership by either public or private actors.

used interchangeably in this study, and I follow other previous studies in distinguishing between *mass expropriation* and *selective expropriation*. Mass expropriation is typically inspired by ideology and does not discriminate between industrial sectors or even ownership source, and is a product of an ongoing revolutionary process. Selective expropriation, on the other hand, is an arm of national regulatory policy, albeit an extreme arm, and largely motivated by economic considerations. Industry-specific factors that reflect economic cost and benefit are an important factor in understanding the phenomenon of selective expropriation.[6]

During the 1960s and 1970s, the growth of the administrative and technical capabilities of developing country governments enhanced their ability to manage expropriated foreign investments for national economic gain. The period was marked by the rise of nationalism and *étatist* economic policies in the wake of disintegrating colonial empires. The diffusion of managerial knowledge coupled with economic interventionism gave rise to the wave of expropriations that began in the late 1960s and continued through the 1970s. Those foreign investments that were not expropriated were subjected to greater control and restriction. The traditional royalty system was replaced by taxes or profit-sharing agreements, and policies to increase local participation in foreign ventures were pushed through.[7]

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3) *Forced Sale* – The use of coercion by the government to induce involuntary divestment through a sale to either local private or public parties.
4) *Contract Renegotiation* – The use of coercion by the government to compel renegotiation of contractual arrangements that result in the effective transfer of ownership to local parties.

See Stephen J. Kobrin, "Foreign Enterprise and Forced Divestment in LDCs," *International Organization* 34 (Winter 1980): pp. 67-9.

[6] Thomas Anderson, *Multinational Investment in Developing Countries: A Study of Taxation and Nationalization* (NY: 1991), pp. 12-3.

[7] Kenneth A. Rodman, *Sanctity Versus Sovereignty: The United States and the Nationalization of Natural Resources Investments* (NY: 1988), pp. 80-2.

An illustration of how economic nationalism has irremediably altered the FDI landscape is provided by the juxtaposition of what happened following right-wing coups in Guatemala in 1954 and Chile in 1973. The nationalized property and assets of United Fruit were restored to their American owners after the successful coup against the Arbenz régime in Guatemala. However, the Chilean military junta two decades later decided to retain control of Chile's four major copper mines, even though it did settle compensation disputes with mining multinationals and restore many properties that had been expropriated. National control over national resources over the intervening decades had become an extremely popular policy among developing countries across the ideological spectrum.[8]

Foreign investments in extractive (agriculture, petroleum and mining) industries are especially vulnerable to the "obsolescing bargain" that afflicts FDI in developing countries. The process of prospecting and mining requires a large amount of up-front capital. It is also a risky undertaking because the success of the venture is in doubt until adequate quantities of minerals are actually discovered. Developing country governments may be happy to promise concessions in order to entice foreign companies to prospect and build mining operations, but temptations to renege on the contract inevitably rise once minerals are discovered and the extractive infrastructure is in place.[9]

Moreover, the operations of extractive industries rely on mature technology, much of which has been widely diffused across the world. Mining operations are also less globally integrated than manufacturing operations, namely they are easier to operate in

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[8] Charles Lipson, *Standing Guard: Protecting Foreign Capital in the Nineteenth and Twentieth Centuries* (Berkeley, CA: 1985), pp. 134-35.

isolation from the overseas assets of the MNC from which they have been seized. Sectors where the local affiliate is tightly-integrated with and highly-dependent on the foreign parent's network of companies are less vulnerable to expropriation, and are best typified by advanced manufacturing industries such as automobiles.

In industries where vertical integration is tight, required parts and other inputs are sourced from other overseas affiliates of the MNC, and marketing of the finished product in overseas markets are also dependent on the parent company. Moreover, the level of technological sophistication required is high, and may be difficult for the host country to master by itself. Expropriating local affiliates whose economic value relies upon integration with a global network of linked companies is generally more costly than profitable. Thus, one important anti-expropriation strategy for MNCs is to locate different aspects of the production or manufacturing process in different countries, but such a strategy is easier to undertake in certain industries than others. State intervention is also self-defeating in sectors where technology changes constantly and rapidly, such as software and pharmaceuticals.[10]

This leads one to suspect that vulnerability to expropriation differs widely across industrial sectors. Investments that are highly visible, involve high fixed costs, and rely on mature technology are most vulnerable to expropriation. Companies involved in such industries indeed became victims of expropriation much more regularly than technology-intensive manufacturing concerns. The empirical record shows that foreign assets in banking, public utilities and extractive industries suffered higher incidences of

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[9] Raymond Vernon, *Sovereignty At Bay: The Multinational Spread of U.S. Enterprises* (NY: 1971), pp. 46-53. Also see James H. Cobbe, *Governments and Mining Companies in Developing Countries* (Boulder, CO: 1979).

expropriation than high-technology manufacturing companies involved in drugs, chemicals and plastics. The more specialized expertise, and access to a global network of suppliers and marketers necessary in more technology-intensive manufacturing industries afford a modicum of protection from expropriation.[11]

ECONOMIC CONSEQUENCES OF THE THREAT OF EXPROPRIATION

Like sovereign debt repudiation, the threat of expropriation has adverse consequences for host countries. The threat of expropriation distorts the international allocation of capital, and makes the host country worse off than if it could not expropriate. Thus, a commitment mechanism on the part of the host country is needed for it to attract the optimal amount of foreign investment capital. The model begins with a small country that uses three factors to produce a single output. These three factors are labor, capital and management expertise, where the first factor is fixed domestically while the last two factors are internationally mobile.[12]

Management encompasses the intangible assets of a foreign investment venture: technical knowledge, organizational skills, and access to overseas markets. It is an

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[10] Eaton & Gersovitz, "Country Risk," pp. 90-2; and David G. Bradley, "Managing Against Expropriation," *Harvard Business Review* 55 (July-August 1977): pp. 75-83.

[11] As observed in a study of the steroid hormone industry in Mexico:

> The production and control of knowledge in the pharmaceutical industry are jealously guarded by the MNCs as close to their center of operations [or home country] as possible. This contributes to a global situation of asymmetrical control in which industry profits are concentrated by multinationals in their home countries or in tax havens....Mexico's bargaining power...is constrained because technology is controlled and there are alternative sources of supply. The MNC threat that "they can go elsewhere" is plausible.

Gary Gereffi, "Drug Firms and Dependency in Mexico: The Case of the Steroid Hormone Industry," *International Organization* 32 (Winter 1978): pp. 258, 285. See also Kobrin, "Foreign Enterprise," pp. 75-81; and David A. Jodice, "Sources of Change in Third World Regimes for Foreign Direct Investment, 1968-1976," *International Organization* 34 (Spring 1980): pp. 180-84.

important complement of the tangible capital assets of the investment, though its importance may fluctuate across industries and host countries. I assume that the managerial expertise brought in by foreign investors will flee the country in the event that the component capital assets are expropriated. In deciding whether or not to expropriate, the host government must weigh the benefits gained from seizing the capital assets against the cost of losing the foreign managerial expertise.

Thus, output (Q) is a function of labor (L), capital (K), and managerial expertise (H):

$$Q = F(L, K, H) \tag{1}$$

where the production function *F(.)* exhibits constant returns to scale. The country has $\overline{L}, \overline{K}, \overline{H}$ endowments of each factor respectively. Since labor is immobile, $L = \overline{L}$, but if the country is a net importer of capital and managerial expertise, then:

$$K > \overline{K} \;\&\; H > \overline{H}$$

H is assumed to make a strictly positive contribution to output:

$$F(L, K, H) > F(L, K, \overline{H}) \text{ for any } H > \overline{H}$$

As the country is small, it faces a world gross rate of return on capital *r* and managerial pay *s* determined in international markets. Foreign investors borrow investment funds at cost (*r*-1) and must repay the principal plus interest even if expropriation occurs. The profits accruing to foreign investors if expropriation does not occur are

$$\Pi^N = F(\overline{L}, K, H) - Y^N - r(K - \overline{K}) - s(H - \overline{H}) \tag{2}$$

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[12] The following model of expropriation is taken from Jonathan Eaton & Mark Gersovitz, "A Theory of Expropriation and Deviations from Perfect Capital Mobility," *Economic Journal* 94 (March 1984): pp. 16-

where Y^N denotes the payment to the host country if expropriation does not occur. In the event of expropriation, no payments are paid to the host country and foreign managerial services are withdrawn. The foreign investors, however, must still repay their creditors. Therefore, the profits of foreign investors in the event of expropriation are

$$\prod^E = -r(K - \overline{K}) \tag{3}$$

and the host country takes over production of Q and obtains national income of

$$Y^E = F(\overline{L}, K, \overline{H}) \tag{4}$$

Expropriation is optimal if $Y^E > Y^N$, assuming that the host government is motivated to maximize national income.

The condition $Y^E = Y^N$ is the borderline between expropriation and no expropriation, and defines a relationship between Y^N and K through equation (4) that is called the *EE* curve. All points below the *EE* curve represent situations of expropriation. For a given Y^N, investment in excess of the corresponding level of K would be expropriated. The slope of the curve is

$$\frac{dY^N}{dK}|_{EE} = F_K(\overline{L}, K, \overline{H}) > 0 \tag{5}$$

Suppose that competition among potential investors causes $F_H = s$ and host country taxes are such that $\prod^N = 0$. This assumption about investor profits in the event of no expropriation gives rise to another relationship between Y^N and K. This is the *II* curve with slope

$$\frac{dY^N}{dK}|_{II} = F_K[\overline{L}, K, \hat{H}(K)] - r \tag{6}$$

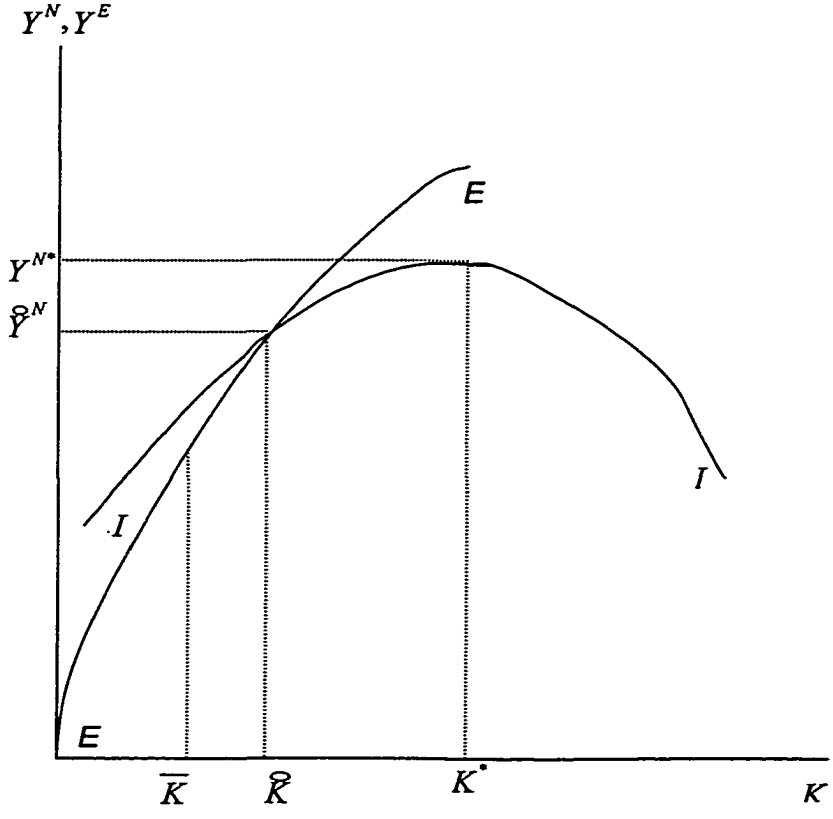
24.

where $\hat{H}(K)$ is given by $F_H(\overline{L}, K, H) = s$.

K^* is defined as the level of K such that

$$F_K[\overline{L}, K^*, \hat{H}(K^*)] = r \tag{7}$$

which is the level of K under conditions of *perfect capital and managerial mobility with no threat of expropriation*. Under the usual assumption that $F_{KK}F_{HH} - F_{KH}^2 > 0$, the Π curve is upward sloping for $K < K^*$ and downward sloping for $K > K^*$.



If the EE and Π curves intersect only at or to the left of $\overline{K}$, the EE curve lies everywhere above the Π curve for $K > \overline{K}$ and no foreign investment is possible because any investment would be expropriated. If the EE curve intersects the Π curve anywhere to the right of K^*, then the host country obtains maximum income of

$$Y^N = F[\bar{L}, K^*, \hat{H}(K^*)] - r(K^* - \bar{K}) - s[\hat{H}(K^*) - \bar{H}]$$

because the point (K^*, Y^{N*}) lies above the *EE* curve. Consequently, the expropriation constraint is not binding.

The expropriation constraint is binding if the curves intersect at a point between $\bar{K}$ and K^*. Equilibrium is at the point $(\tilde{K}, \tilde{Y}^N)$, where the *EE* curve cuts the *Π* curve from below. At the equilibrium when the expropriation constraint is binding, the following conditions determines the host country's capital stock:

$$F_K(\bar{L}, K, \bar{H}) > F_K[\bar{L}, K, \hat{H}(K)] = r \tag{8a}$$

$$\Pi^N = 0 \tag{8b}$$

$$Y^E = Y^N \tag{8c}$$

Therefore, $K < K^*$ when the threat of expropriation is binding, and the marginal product of capital of the host country exceeds the world interest rate *r*. In other words, *a country's lack of credibility in committing to honor foreign investment contracts will restrict the movement of capital into its territory*, and causes a negative deviation from the situation of perfect capital mobility.

In terms of how each factor effects the desirability of expropriation, a higher level of $\bar{K}$ raises the total level of capital and reduces dependence on foreign capital. A unit increase in $\bar{K}$ shifts the *Π* curve up by an amount *r*, which would raise the equilibrium levels of Y^N and $\bar{K}$. The availability of more local managerial expertise also makes expropriation more desirable. Moreover, unit increases in the prices of the international mobile factors (*r* and *s*) have no effect on the *EE* curve but shift the *Π* curve down. The

price increases depress national income through an adverse terms of trade effect, and raise the incentive to expropriate at a given level of foreign investment.

If a penalty of P is imposed in case of expropriation by the host country, equation (4) can be modified to

$$Y^E = F(\bar{L}, K, \bar{H}) - P$$

An increase in P above 0 does not affect the Π curve, but causes a downward shift to the EE curve. This increases foreign investment and national income, and a penalty for expropriation in this model will make a capital-importing host country better off. *The host country gains credibility by being subject to a penalty in the event it expropriates foreign-owned assets.* This penalty is a commitment mechanism, which enhances sovereign credibility. The self-policing behavior of foreign investors could furnish such a penalty threat by ostracizing host countries that have cheated, and hence support cooperative outcomes.

The above discussion clearly demonstrates that host countries seeking foreign capital and managerial expertise need to project a strong credibility not to expropriate foreign-owned assets. Lack of sovereign credibility will restrict the import of foreign capital. Moreover, the existence of a penalty against the host country in the event it nationalizes foreign investments serves as a commitment mechanism that increases the reliability of a given host country.

The environmental conditions that nourish mutual cooperation exist. The prerequisite of a transparent record of past behavior is not difficult to satisfy in FDI in the petroleum industry. Expropriations are distinct events and easy to observe. Majority-ownership investments in the petroleum sector can also be easily viewed as an iterated

game with a relatively small population of players that are generally long-lived, or at least whose demise are difficult to forecast. Given these conditions, past behavior is expected to influence investors' perceptions of particular countries. Moreover, political instability and degree of democracy should also help determine the level of behavioral credibility of a given host country.

As selective expropriation is an arm of public policy carried out by presumably rational governments, political considerations are important. Governments in a high political instability setting would discount future benefits heavily and fear the negative consequences of expropriation less. Unpopular governments may also resort to expropriation as part of a nationalist policy to gain greater domestic political support. Non-democracies, on the other hand, offer less institutional and legal protection for the property rights of foreigners. Moreover, state officials in non-democracies may find it easier to seize the gains from expropriation for themselves because of the lack of public accountability. This would make these state officials more predisposed to a policy of selective expropriation. Strong rule of law also provides protection against discriminatory and selective policies aimed at foreign asset owners.

Last but not least, foreign investors should pay close attention to the past behavioral record of potential host countries. Self-policing behavior helps nurture widespread mutual cooperation in anarchic settings, as explained in the earlier portions of this study. In this framework, investors need to punish countries that have expropriated foreign-owned assets in the past. Expropriation theory confirms that the existence of a penalty against cheating host countries will increase the flow of investment capital. The three variables of past behavior, political instability, and degree of democracy are

hypothesized to influence the level of sovereign behavioral credibility in petroleum industry FDI.

EXPROPRIATIONS IN HISTORY

Peacetime expropriation of direct investment stock owned by foreign nationals prior to WWII was extremely rare. The international legal rules and norms devised by European countries virtually prohibited peacetime confiscation of foreigners' assets. Expropriation was deemed acceptable only in cases of overriding public interest and had to be non-discriminatory. Both independent judicial review and full compensation had to be provided following any seizure or confiscation.[13]

The European framework concerning the property rights of foreign investors was extended to the colonies, and guaranteed by the extraterritorial application of European laws in non-colonial areas outside of Latin America. Uncompensated seizure of foreigners' properties was considered akin to robbery, and force was often threatened and occasionally used.[14] The various Western powers assumed the role of protector of foreign investors' property rights in their respective spheres of influence. The United States, for instance, assumed responsibility to protect the rights of foreigners in the Caribbean through the Roosevelt Corollary to the Monroe Doctrine (1903). There followed two decades of coastal landings, armed interventions and occupations.[15]

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[13] See Alexander P. Fachiri, "Expropriation and International Law," *British Year Book of International Law* 6 (1925): pp. 159-71; Clyde Eagleton, *The Responsibility of States in International Law* (New York: 1928); and H. Neufeld, *The International Protection of Private Creditors from the Treaties of Westphalia to the Congress of Vienna, 1648-1815* (Leiden: 1971).

[14] Lipson, *Standing Guard*, pp. 12-6, 53-64.

[15] See Dana Munro, *Intervention and Dollar Diplomacy in the Caribbean, 1900-1921* (Princeton, NJ: 1964); and Samuel Flagg Bemis, *The Latin American Policy of the United States* (New York: 1943).

To this day, most countries accept that countries have to observe "minimum international standards" in their treatment of foreign nationals.[16] However, there is broad disagreement over the content of the minimum international standards. According to the industrialized countries, the minimum international standards principle contains two rules of customary law concerning expropriation. First, expropriation must be for a public purpose and non-discriminatory. Second, expropriation must be accompanied by "prompt, adequate and effective compensation."[17]

The first instances of selective expropriation by developing countries occurred in Turkey, Mexico and Bolivia during the interwar period. The nationalist Turkish state founded by Kamal Atatürk pursued an *étatist* policy of modernization after the effects of the Great Depression spread to Turkey in the early 1930s. State-owned banks exerted control over the financing and direction of capital investments. They also purchased foreign-owned companies, mostly public utilities. Fair prices were paid for these purchases, but Turkish policy is significant because the state became actively involved in directing economic development, and foreign investments were judged by their contribution to national development. Although Turkish policy towards foreign investments was lenient, it was the first manifestation of the economic nationalism that would lead to widespread nationalization by developing countries several decades later.[18]

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[16] The principle of a higher standard of behavior regarding a government's conduct towards foreign nationals is affirmed by the Foreign Relations Law of the United States:

> Some states maintain that an alien is not entitled to a higher standard of justice than a national... This Section [of U.S. law] follows the prevailing rule that such national treatment is not always sufficient, and that there is an international standard of justice that a state much observe in the treatment of its own nationals, and even if the standard is inconsistent with its own law.

American Law Institute, *Restatement of the Law, Second: Foreign Relations Law of the United States*. St. Paul, MN: 1965), p. 165.

[17] Michael Akehurst, *A Modern Introduction to International Law* (London: 1991), pp. 92-3.

[18] Korkut Boratov, "Kemalist Economic Policy and Étatism," in Ali Kazancigil & Ergun Özbudun (eds.), *Atatürk: Founder of a Modern State* (Hamden, CN: 1981), p. 174; and Max Weston Thornburg, Graham Spry & George Soule, *Turkey: An Economic Appraisal* (NY: 1949), p. 34.

After Franklin Roosevelt abjured the Roosevelt Corollary upon coming to office in 1933, there quickly arose challenges to American-owned investments in Bolivia and Mexico. Bolivia nationalized a subsidiary of Standard Oil of New Jersey in 1937, and refused to offer any compensation. The State Department averred from interceding diplomatically in the dispute between Bolivia and Standard Oil, and instead asked the latter to exhaust local remedies. A greater challenge soon emerged from Mexico. Article 27 of the Mexican Constitution of 1917 had declared that all underground resources belonged to the Mexican state. Both the foreign oil companies and the Mexican government agreed to disagree for much of the succeeding two decades. However, the economic depression of the 1930s prompted President Lázaro Cárdenas to expropriate the local operations of foreign oil companies in March 1938. Compensation corresponding to book value of the expropriated assets was offered in the form of an immediate down payment and balance to be paid from future profits.[19]

The major oil companies assumed a hard-line stance and boycotted Mexican crude. Washington reacted strongly this time, and even felt compelled to tighten its policy towards Bolivia by denying official loans and technical assistance to Bolivia until the Standard Oil controversy in the country was settled satisfactorily to both sides. However, the United States quickly relented after war erupted in Europe and the Axis powers showed some unhealthy interest in Latin American oil supplies. Washington wanted access to Mexican oil supplies in the event of war, and cared little about who owned those supplies. Settlements in favor of both Mexico and Bolivia were reached in

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[19] Rodman, *Sanctity Versus Sovereignty*, pp. 107-12; and Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (NY: 1992), pp. 272-76.

early 1942, and the American oil companies eventually accepted the settlement plan with compensation paid for by American government loans to the two countries. [20]

There were few cases of expropriations in the early post-WWII period, other than the incidences of ideologically inspired mass expropriations in the wake of communist takeovers in Eastern Europe, China and Cuba. These expropriations covered private property in general, and did not distinguish between foreign or local ownership. The prominent cases of selective expropriation that did happen during this period were the Iranian nationalization of Anglo-Persian Oil Company in 1951 and the Egyptian seizure of the Suez canal in 1956.[21]

A dramatic shift from ideologically to economically motivated acts of expropriations commenced in the 1960s. The international legal norms safeguarding the rights of foreign investors were subjected to fierce attack in international forums as selective expropriation grew apace in developing countries. The UN General Assembly passed Resolution 1803 on Permanent Sovereignty over Natural Resources in 1962, which was a compromise between the old rules supported by developed countries and the growing impetus for expropriation emerging in the socialist bloc and developing countries:

> Nationalization, expropriation or requisitioning shall be based on grounds or reasons of public utility, security or the national interest....In such cases, the owner shall be paid appropriate compensation, in accordance with the rules in force in the state taking such measures in the exercise of its sovereignty and in accordance with international law.[22]

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[20] Brye Wood, *The Making of the Good Neighbor Policy* (NY: 1961), pp. 180-82, 228-33, 252-58; and Rodman, *Sanctity*, pp. 112-25.
[21] For the events surrounding the Suez expropriation, see Keith Kyle, *Suez* (NY: 1991).
[22] Text of resolution quoted in Louis Henkin, Richard Crawford Pugh, Oscar Schachter & Hans Smit (eds.), *Basic Documents Supplement to International Law Cases and Materials*, 3rd edition (St. Paul, MN: 1993), p. 523.

The compromise soon collapsed and there followed other resolutions steadily promulgating the increasing erosion of traditional international legal norms by explicitly preventing external intervention in controversies over expropriated foreign-owned property.[23] These developing country-led measures culminated in Resolution 3281, known as the Charter of Economic Rights and Duties of States, adopted by the General Assembly in December 1974. Article Two of the Charter declares that "every State has...full permanent sovereignty, including possession, use and disposal, over all its wealth, natural resources, and economic activities." The question concerning compensation for acts of nationalization is to be "settled under the domestic law of the nationalizing State and by its tribunals."[24] The effect of these resolutions is to convey the principle that foreign-owned companies operated at the discretion of the developing host countries, though it remains questionable whether they represent new customary international law.[25]

Table 1: Acts of Expropriation*

Partially or Wholly Foreign-Owned Firms, 1960-1976

Period	% of Expropriation Acts
1960-1967	19.3
1968-1972	37.7
1973-1976	43.0

* Kobrin, "Foreign Enterprise," p. 74.

[23] The General Assembly Resolution 3171 on Permanent Sovereignty over Natural Resources affirms that "the application of nationalization carried out by States...implies that each State is entitled to determine the amount of possible compensation and the mode of payment, and that any disputes which might arise should be settled in accordance with the national legislation of each State carrying out such measures." In Henkin, Pugh, Schachter & Smit, *Basic Documents*, p. 524.

[24] Henkin, Pugh, Schachter & Smit, *Basic Documents*, p. 513.

[25] Tony Smith, "Changing Configurations of Power in North-South Relations since 1945," *International Organization* 31 (Winter 1977): p. 5.

As the international legal norms protecting direct investments slowly withered away, selective expropriation became a major issue beginning in the late 1960s. The overwhelming bulk of selective expropriations in the postwar period occurred between 1968 and 1976, and there were important sectoral differences as discussed above. Wholly-owned subsidiaries were the target of about three-fourths of all expropriation acts. All in all, the number of expropriations carried out between 1968 and 1976 constitutes 72.1 percent of all acts executed between 1965 and 1985 (Table 1). Expropriations after 1979 were extremely rare.[26]

BILATERAL TREATIES AND INVESTMENT INSURANCE

One response of the United States to the decline of international legal norms protecting the rights of foreign investors has been the pursuit of Bilateral Investment Treaties (BIT) with individual countries. These treaties, which are formally known as *Treaties Concerning the Reciprocal Encouragement and Protection of Investments*, are bilateral legal instruments to protect foreign private investments against political risks. BITs typically protect against expropriation, and provide for "prompt, adequate and effective compensation" at the "fair market value of the expropriated asset" at the time of expropriation. Recent treaties also provide for settling disputes between a contracting state and foreign investor by binding third-party arbitration with no requirement for prior exhaustion of remedies in the host country. The United States has signed BITs with over twenty countries.[27]

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[26] Andersson, *Multinational Investment*, p. 121-22.
[27] Louis Henkin, Richard Crawford Pugh, Oscar Schachter & Hans Smit (eds.), *International Law: Cases and Materials*, 3rd edition (St. Paul, MN: 1993), pp. 764-69.

Although the increasing popularity of BITs may eventually evolve over time into a broad-based multilateral investment protection agreement, such an evolution is likely to be a very long-term affair. International investment is presently not regulated by a cohesive international legal regime similar to the one covering global trade. There still remains a vast gulf separating industrialized and developing countries pertaining to agreed international principles and rules covering the rights of foreign investors.

Many industrialized countries have instituted bilateral investment insurance schemes to encourage investments by their nationals in selected developing countries. The Overseas Private Investment Corporation (OPIC) offers insurance to American investors in "less developed friendly countries" against certain non-commercial risks, including expropriation. Before any coverage is provided, OPIC must be assured through bilateral agreements between the United States and host country that the rights of the United States as assignee and subrogee are recognized. Insurance contracts are written for a maximum of twenty years with premiums payable annually. The premium rates vary with the nature of the investment and the coverage selected, but do not vary with the identity of the host country. In 1999, OPIC insured forty-five investment projects with a total coverage value of US$3.2 billion.[28]

Furthermore, the Multilateral Investment Guarantee Agency (MIGA) is a multilateral agency that issues guarantees against non-commercial risks to encourage the flow of investment to less developed countries. MIGA is a member of the World Bank group, and began operations in 1990. As of 30 April 2000, MIGA has a membership of 152 countries and subscribed capital of about US$2 billion. The non-commercial risks covered by MIGA are currency transfer restrictions, expropriation, repudiation or breach

of contract by host government, and losses caused by war or civil disturbances. In fiscal year 1999, MIGA issued seventy-two investment guarantee contracts with a total insurance coverage of US$1.3 billion.[29]

It is important to recognize that both bilateral and multilateral investment insurance programs do not proscribe expropriation *per se*, though they do mitigate the financial effects for the insured in the event of expropriation. There is no international multilateral convention or institution protecting the rights of foreign investors. Investment insurance programs do not provide legal protection against expropriation, but only financial compensation in the event it occurs. The investment insurance schemes are a symptom of the non-commercial uncertainties faced by foreign investors in developing countries. These uncertainties are nurtured by a lack of international institutions and norms regulating and protecting FDI.

PETROLEUM INDUSTRY

One of the most dramatic effects of expropriation policy is in the petroleum industry, specifically in the ownership and production of crude oil. Oil has long been one of the most prominent commodities targeted by FDI. Up to the early 1970s, the worldwide petroleum industry accounted for about one-third of both the stock and flow of FDI to developing countries. The "Seven Sisters" (British-Petroleum, Chevron, Exxon, Gulf, Mobil, Royal Dutch Shell and Texaco) controlled virtually all oil produced and traded outside North America and the communist bloc in the 1950s. By the early 1970s, their percentage of ownership had declined to a still daunting 61 percent, with

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[28] See www.opic.gov for information about OPIC.

independent oil companies controlling most of the remainder. By the end of the decade, however, share of crude ownership controlled by the major companies had fallen to 25 percent. The independents' share slipped from 33 percent to 20 percent. State oil companies were the big winners through expropriations, with their share rocketing from 6 percent to 55 percent.[30]

Petroleum operations outside the United States were historically based on the concession system pioneered in Persia in 1901. The basis of the concession system was contractual rights obtained from a sovereign whereby an oil company would be allowed to explore for, own, and produce oil in a given territory. The original D'Arcy concession in Persia, which launched the direct ancestor of today's British-Petroleum, encompassed 480,000 square miles.[31] Nationalist governments came to view the concession system as an adjunct of the Western imperialist system, and an affront to their claims of national sovereignty.

After the Mexican expropriation in 1938, government takeover of foreign–owned petroleum companies in developing countries generally proceeded at a very cautious pace until the early 1970s. In the midst of the Second World War, Venezuela crafted a landmark "fifty-fifty" profit-sharing agreement with the various foreign oil companies operating in its territory in which the government's revenues from oil royalties and taxes would equal the companies' net profits derived from their Venezuelan operations.

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[29] Henkin, Pugh, Schachter & Smit, *International Law*, pp. 1460-68; and www.miga.org.

[30] See J. E. Hartshorn, "From Multinational to National Oil: The Structural Change," *Journal of Energy and Development* 5 (Spring 1980): pp. 207-20; and Peter F. Cowhey, "The Engineers and the Price System Revisited: The Future of the International Oil Corporations," in Jonathan David Aronson & Peter F. Cowhey (eds.), *Profit and the Pursuit of Energy: Markets and Regulation* (Boulder, CO: 1983), pp. 9-52.

[31] For the story of oil exploration in pre-WWII Persia, see Ronald W. Ferrier, *The History of the British Petroleum Company, Vol. 1: The Developing Years, 1901-1932* (NY: 1982). For the story of the origins of the Aramco concession in Saudi Arabia, see Anthony Cave Brown, *Oil, God, and Gold: The Story of Aramco and the Saudi Kings* (NY: 1999), pp. 43-56, 77-8.

Washington played a major role in encouraging American oil companies to accept the agreement.[32] Saudi Arabia soon demanded that the "fifty-fifty" principle be adopted by the four American oil companies operating in its territory in the joint venture known as the Arabian-American Oil Company (Aramco), and a settlement was signed in December 1950. Naturally, the Kuwaitis and Iraqis demanded similar arrangements, and soon got them.[33]

However, the fifty-fifty deal was not enough to appease Iranian nationalist hardliners. Mohammed Mossadegh was appointed premier by the Iranian parliament (Majlis) in April 1951 to execute a recently passed nationalization law. Thus, began the infamous saga of the Anglo-Iranian expropriation and the various intrigues it spawned. In the end, Mossadegh was overthrown in August 1953 and the Shah returned to power. The structure of the new Western oil consortium formed to oversee oil operations in Iran after the crisis marked a turning point for the global petroleum industry. All the foreign oil companies acknowledged that the oil assets belonged to Iran, which implicitly abrogated the concession system in the country. The consortium would formally only act as a contract agent for Iran's National Iranian Oil Company (NIOC) by managing the Iranian oil industry and buying all the output.[34]

Another turning point was reached several years later. A glut in the global supply of oil during the 1950s led directly to the birth of the Organization of Petroleum Producing Countries (OPEC). A producing country's revenues, which consisted of taxes and royalties, from foreign oil operators were based on the "posted" or official price of

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[32] Paul E. Sigmund, *Multinationals in Latin America: The Politics of Nationalization* (Madison, WI: 1980), pp. 229-31.
[33] Rodman, *Sanctity Versus Sovereignty*, pp. 141-47.

crude. The posted price originally matched the market price, but the supply glut caused the two to diverge as the market price fell. By the late 1950s, the producing countries were taking a much higher percentage of the profits from the sale of crude oil than the agreed-upon 50 percent. Obviously, the situation was untenable for the oil companies, who reacted by individually cutting the posted price in 1959 and 1960. These moves were greeted with outrage by the producing countries who saw their national revenues unilaterally slashed. The major oil exporting countries – Saudi Arabia, Venezuela, Kuwait, Iraq, Iran - convened in Baghdad, and founded OPEC on September 14, 1960. The OPEC members pledged themselves to a united front against any unilateral actions by the oil companies against them. The posted price was never cut again.[35]

The 1960s were politically a quiet time for the global petroleum industry, but the winds of nationalism were gathering force and would soon sweep away the oil concessions. The first Arab oil embargo was proclaimed during early days of the Six-Day War, but the effects of the embargo were much less severe than expected. Extra production from U.S., Venezuelan and Iranian oil wells covered most of the shortfall. However, the twenty-year global oil surplus was fast coming to an end. Non-Soviet bloc petroleum demand rose from almost 19 million barrels per day to more than 44 million barrels per day in 1972. By 1973, the available surplus production capacity had shrunk to only 500,000 barrels per day, which constituted about 1 percent to free world consumption.[36]

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[34] Yergin, *Prize*, pp. 450-78; and Benjamin Shwadran, *The Middle East, Oil, and the Great Powers* (NY: 1973), pp. 90-4.
[35] Ian Skeet, *OPEC: Twenty-five Years of Prices and Politics* (Cambridge, UK: 1988), pp. 22-3.
[36] Yergin, *Prize*, pp. 554-58, 567-68, 586.

The growing tightness in the world oil market, exacerbated by transportation pressures caused by the closing of the Suez Canal, emboldened the Qadaffi regime in Libya. Occidental, which had no alternative sources of oil outside of the United States, was compelled to accept a 20 percent increase in the royalties and taxes paid to the Libyan government. The posted price was raised, but more importantly, Libya's share of the oil profits were increased from the psychological barrier of 50 percent to 58 percent. The other oil companies operating in Libya, except Gulf and Philips which decided to surrender their concessions and leave, caved in soon thereafter in September 1970. OPEC soon endorsed the 55 percent target as the minimum host country share, and threatened a cutoff if its demands were not met. The oil companies had no choice but to agree, and the fifty-fifty principle was officially laid to rest on February 14, 1971. The posted price was also increased. The Shah was one of the key figures pushing for the new agreement with tacit support from Washington, which was more interested in maintaining Iran as a bulwark against the U.S.S.R. than furthering the interests of Western oil companies.[37]

The first major petroleum asset nationalization in the post-WWII era occurred on February 24, 1971 when Algeria expropriated 51 percent of all French oil and natural gas interests in the country. As a pretext to punish the British for "collusion" in the Iranian seizure of some small islands near the Strait of Hormuz, the Libyan government nationalized British-Petroleum holdings in the country in late 1971. Six months later, the Iraqi government nationalized the Iraq Petroleum Company (IPC), which was the longstanding joint venture of BP, Exxon, Mobil, Shell, CFP, and the Gulbenkian estate to

[37] Rodman, *Sanctity Versus Sovereignty*, pp. 236-43.

explore and produce oil in Iraq. In all three countries, initial attempts by the aggrieved oil companies to call for a boycott of "hot" crude were soon followed by capitulation.[38]

In line with the times, the more moderate Gulf countries insisted on "participation," whereby the host country were to be given an increasing share of stock of the subsidiaries operating in their territory. A participation agreement was duly signed between the Gulf states and the oil companies, which provided for an immediate 25 percent participation share with steady augmentations to the level of 51 percent by 1983. The Shah, whose country was already the acknowledged owner of oil assets in the country, pressured the oil companies to also recognize NIOC as the operator of those assets. A new consortium was set up by the Western oil companies to act as a service contractor to NIOC.[39]

The collapse of the old order gathered pace. OPEC unilaterally raised the posted price to $5.11 following the start of the Yom Kippur War in 1973. The Western oil companies were totally excluded from the decision. The price increase was soon followed by the second Arab oil embargo. This time the tight global oil market made the embargo much more effective and disruptive than the first one five years ago. Two months later in December, the posted price was further increased to $11.65 at the suggestion of the Shah. The oil producers had raised the posted price by fiat from $1.80 to $11.65 in the short span of three years. Much of the resulting dizzying rise in the oil revenues of the producers went into bulging accounts in various Western banks. The funds were recycled

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[38] Rodman, *Sanctity Versus Sovereignty*, pp. 245-49, 255-60.
[39] *Ibid*, pp. 249-55; and Yergin, *Prize*, pp. 583-85.

as sovereign loans to developing countries, and contributed to the overlending and resulting debt crisis that was the subject of the earlier chapters of this study.[40]

The final takeovers that sounded the death knell of the concession system occurred within the next several years. Foreign ownership was terminated long before the 1980s, when the "participation" agreements and other domestic laws were supposed to end the concessions. Kuwait took over the remainder of the Kuwait oil company from BP and Gulf in March 1975. Venezuela acquired effective control over its domestic oil industry, including an effective tax rate of 96 percent, by 1972. Petroleós de Venuezuela, the state oil company, assumed control over the old concessions on New Year's Day 1976. The largest concession of all in Saudi Arabia, encompassing a quarter of all proven free world reserves, was finally surrendered in January 1976.[41]

MNCs have learnt to adapt and "expect to protect profits by relying on their other advantages, including global networks for manufacturing, transporting, and marketing finished products."[42] Other than the investment insurance schemes offered by several industrialized countries, private companies aiming to invest in extractive industries overseas are now expected to basically look out for themselves. Rational foreign investors in the extractive industries should be particularly alert to the credibility of potential host countries. In a milieu where the expectation of third-party intervention, whether diplomatic, economic or military, is low, we would expect private agents to be more sensitive to credibility considerations.

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[40] Yergin, *Prize*, pp. 605-09, 625-26; and Pierre Terzian, *OPEC: The Inside Story*, trans. Michael Pallis (London: 1985), pp. 170-75.
[41] Yergin, *Prize*, pp. 646-52; Gustavo Coronel, *The Nationalization of the Venezuelan Oil Industry: From Technocratic Success to Political Failure* (Lexington, MA: 1983), pp. 66-71; and Brown, *Oil, God, and Gold*, pp. 359-62.
[42] Lipson, *Standing Guard*, p. 225.

As expropriations became popular and widespread among developing countries, Washington's stance with regard to the phenomenon has evolved. Even staunch right-wing regimes and American allies such as Saudi Arabia and pre-revolutionary Iran nationalized foreign oil concessions, which were frequently owned by private American companies. Changing perceptions of expropriation helps explain the relaxation of the official U.S. position vis-á-vis expropriation:

> ...the U.S. government has modified its own policies – from resistant and sometimes punitive responses to adaptive ones. Gone are the overt sanctions and highly charged language of the Hickenlooper amendment. In their place stand quiet policies of government risk-sharing such as [investment] guaranty insurance.[43]

The challenge against foreign ownership of natural resource extraction became so overwhelming that Washington has effectively acquiesced to the expropriation of American-owned extractive enterprises.[44]

CONCLUSION

Sovereign credibility is an important determinant of FDI flows to developing countries because there are no global institutions protecting the rights of foreign investors. Although there are bilateral treaties, and even some multilateral treaties among industrialized countries, that protect foreign investments, most countries in the world are not party to these treaties, including large developing countries like China and India. Similar to the sovereign bank debt issue-area, the lack of third-party enforcement makes sovereign credibility highly important in explaining why foreign investors treat various countries differently.

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[43] Lipson, *Standing Guard*, p. 258.
[44] See Rodman, *Sanctity Versus Sovereignty*, pp. 270-340.

The theoretical model demonstrates that countries able to commit credibly would receive more investment funds than if otherwise. Selective expropriation is part of public policy, and domestic political conditions are expected to have some bearing on the deliberation of such policies. Politically stable governments and democracies are expected to project higher levels of sovereign behavioral credibility.

The use of selective expropriation has been acute in extractive industries, especially the petroleum industry. Four decades ago, the petroleum industry accounted for the bulk of the stock and flow of FDI from developed countries to developing countries. Beginning in 1970, however, oil-producing countries pursued an aggressive strategy of expropriating foreign oil concessions and operations. Even the governments of developed countries, who were formerly vociferous defenders of foreign property rights, have effectively acquiesced to the norm among developing countries of expropriating foreign-owned petroleum assets. This history of expropriation makes petroleum industry FDI a prominent issue-area in which to analyze for credibility affects.

Oil-producing countries unable to project a high level credibility would not obtain as much foreign investment as other countries that are able to do so. Consequently, I expect credibility to play a vital role in explaining FDI flows. As before, the three variables hypothesized to affect the level of behavioral credibility are past behavior, political instability, and degree of democracy. The hypotheses regarding sovereign credibility in petroleum FDI are tested in the following chapter.

PETROLEUM FDI: EMPIRICAL RESULTS

This chapter presents empirical analyses of credibility effects in petroleum FDI. I will again base the individual hypotheses concerning behavioral credibility on the variables listed in the third chapter. The sample consists of annual data on direct investments by U.S. parent companies in their foreign affiliates involved in the petroleum industry between 1985 and 1995 inclusive. Unlike sovereign debt, there are few compelling studies on the determinants of risk in FDI. The analyses in this chapter depend on panel data econometric methods.

The three potential determinants of sovereign behavioral credibility outlined in earlier chapters are again tested in the issue-area of petroleum industry FDI, and are worth repeating in detail. I expect to find that countries with past records of expropriation will not attract as much FDI as countries with unblemished records *ceteris paribus*, if the hypothesis is correct. Democracies are also hypothesized to be more credible than non-democracies, so the former is expected to attract more investments *ceteris paribus*. Furthermore, foreign investors should be more wary of politically unstable host countries, and invest less in them *ceteris paribus*, if the hypothesis of behavioral credibility is correct.

The econometric results are somewhat supportive of the sovereign behavioral credibility hypothesis. Past behavior is found to be statistically significant and affects sovereign credibility in the posited direction in all the regressions. Democracy is significant in some equations but not in others. The political instability variable is again not statistically significant in any of the analyses. The overall result is similar to that encountered in the empirical chapter for sovereign bank debt.

DATA

The data used in the empirical analysis covers the 1985-1995 period. I have controlled for the vast differences between various industries, which have their own economic and political risk profiles with regard to expropriation (as explained in the last chapter), by concentrating the analysis exclusively on one industry, namely the petroleum industry. However, there are major differences in the various sub-categories of the petroleum industry. The economic and political risk profiles of a crude oil extraction enterprise are different from that of a refinery. Crude oil extractive enterprises are generally regarded as more vulnerable than non-extractive enterprises. There is no publicly available data for foreign investment in the various sub-categories of an industry broken down by host country. Therefore, I have decided to only use data for *net oil-exporting countries*, as a rough proxy for investments in crude oil extraction.

Unlike sovereign debt, there is no obvious proxy for the risk premium in FDI. This is one of the largest obstacles to empirical studies on the risk profile of FDI. Theoretically, the risk premium could be calculated from the internal rate of return (IRR) that foreign investors use to evaluate their investment projects, but there is no publicly available data on the individual IRR of foreign investors in various projects. The dependent variable in the sovereign debt issue-area is relatively easy, but it is not as straightforward in the case of FDI.

I have constructed a dependent variable that I believe captures some part of expropriation risk in FDI. The dependent variable is the change in the value of "Net Property, Plant, and Equipment" (NPPE) of *majority-owned* foreign affiliates of U.S.

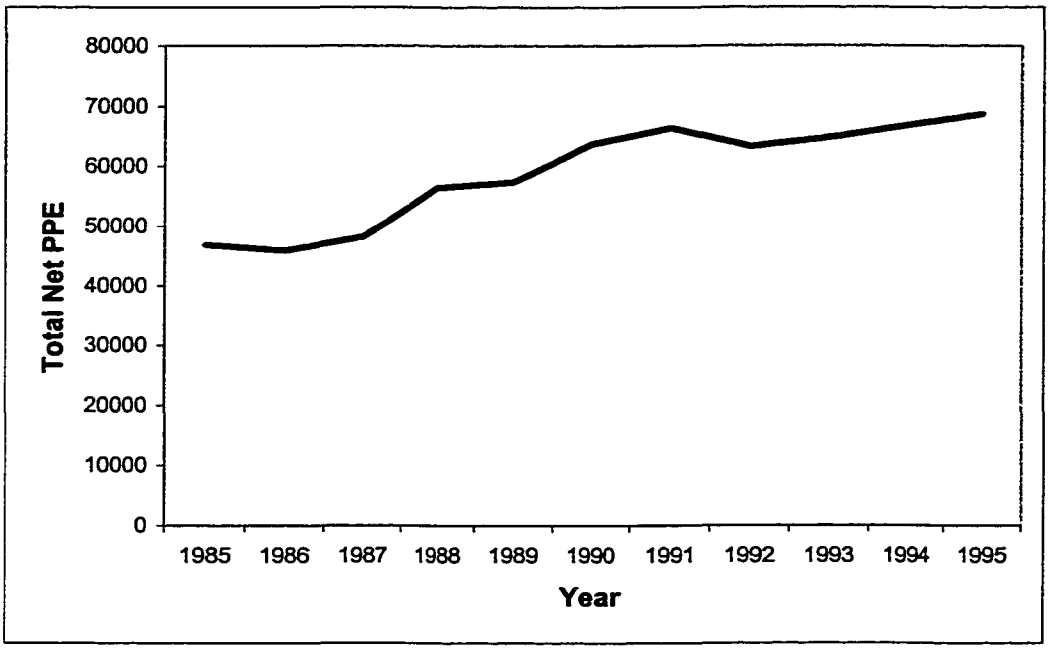
parent companies in a specific country between year *t* and year *t-1*, *and* divided by the monetary value of the crude oil output of the same country in year *t-1*. In other words, the dependent variable is the change in long-term fixed assets relative to the lagged total oil output of the host country. The NPPE data are obtained from various editions of *U.S. Direct Investment Abroad*, which is published by the U.S. Department of Commerce. The final revised data are typically made available three to four years after the date of the data.

The dependent variable is based on long-term fixed assets, as the accounting category of "Net Property, Plant, and Equipment" ("Net" meaning net of depreciation) is used for non-current (meaning expected to be of use to the business entity for longer than one year) fixed assets such as buildings, plants, property, vehicles *et cetera*. These are assets that are firmly "on the ground," so to speak, and could be easily seized by host country governments intent on expropriation. I have chosen to only use data for majority-owned foreign affiliates because they are more vulnerable to expropriation and the victim would be more clearly foreign, compared to minority equity stakes in local joint ventures.

Chart 1 shows the total "Net Property, Plant, and Equipment" of majority-owned foreign affiliates of U.S. companies in sixteen host countries during the period under study. The sixteen countries in question are *all* the net oil-exporting countries for which data on majority-owned U.S. FDI in the petroleum industry in terms of NPPE are available. The specific publicly available figures on NPPE and the total oil output of the sixteen countries between, and including, 1985 and 1995 are listed in the back of this chapter. Note that data are not publicly disclosed for some host countries for certain years. The data for total oil production and price per barrel of oil produced are taken from

various editions of *International Energy Annual* published by the U.S. Department of Energy.

Chart 1: Total Net Plant Property Equipment of Majority-Owned U.S. FDI in the Petroleum Industry, 1985-1995



The past behavior variable is based on data on past acts of expropriation. The expropriation data I have lists the of acts of expropriation from 1960 to 1980 by developing countries, and is grouped by country and industry. The data was compiled by Professor Thomas Andersson of the OECD. Two related proxies are used for indicating past behavior: a dummy variable for the occurrence of at least one instance of expropriation of foreign-owned assets in the petroleum between 1960 and 1980; and a variable specifying the actual number of expropriation acts of foreign-owned assets in the petroleum industry during that same period. There are no figures available for expropriations after the early 1980s, but such acts were rare. I will only use data for cases

of selective expropriation in the petroleum industry. The hypothesis is that past expropriations have a negative effect on FDI.

The democracy dummy variable is again based on the *Freedom House* index. Countries with freedom index scores of 2 or less are labeled 1, and those with higher scores are labeled 0. If the credibility hypothesis is correct in that democracies are seen as more credible than non-democracies, then I expect to see a positive relationship between changes in NPPE and the democracy dummy.

The political instability variable will again be constructed from the random effects probit method outlined in Chapter 5. The variable is a measure of the probability of an imminent change in the chief executive of country *i* at year *t*. The explanatory variables used in estimating the probability of a change in the executive are: assassinations, riots, demonstrations, strikes, instances of guerrilla attacks, revolts (indicating successful coups and attempted coups), coups, cabinet changes, legislative elections, lagged cabinet changes, lagged executive changes, democracy, log of per capita income, lagged log of inflation, and the per capita GNP growth rate. The political events data is from the *Cross-National Time-Series Data Archive* (CNTS) founded by Arthur Banks, and covers the years 1980 to 1995. The economic data is from the *World Development Indicators* dataset compiled by the World Bank. The estimates are based on a much larger sample of host countries and years than those in the FDI sample. The political instability regressions include all countries that are individually listed in *U.S. Direct Investment Abroad* as hosts of "Net Property, Plant, and Equipment" belonging to majority-owned foreign affiliates of U.S. parent companies in all industries between 1980 and 1995.

Table 1: Random Effects Probit Results for Change in Executive*

	Model 1	Model 2	Model 3
Assassinations	0.0627 (0.0453)	0.0591 (0.0383)	
Riots	-0.0113 (0.0395)	-0.0353 (0.0236)	
Demonstrations	-0.0354 (0.0415)		
General strikes	0.0786 (0.0948)		
Guerrilla attacks	-0.1761 (0.1757)		
Revolts	-0.0965 (0.1749)	-0.3296** (0.1022)	-0.2881** (0.0987)
Coups	1.7046* (0.8862)	1.8325** (0.5891)	1.9381** (0.5791)
Cabinet changes	1.7285** (0.1508)	1.7042** (0.1348)	1.6833** (0.1310)
Legislative elections	0.7070** (0.1415)	0.7509** (0.1290)	0.7586** (0.1264)
Democracy	0.3672* (0.2004)	0.3873** (0.1681)	0.4121** (0.1494)
Lagged executive changes	-0.0082 (0.1853)		
Lagged cabinet changes	0.0147 (0.1487)		
Log of per capita GNP	-0.0531 (0.0664)	-0.0278 (0.0541)	
Log of lagged inflation	-0.0254 (0.0516)		
Lagged of per capita GNP growth	-0.0032 (0.0031)	0.0000 (0.0002)	
n n*T	52 695	52 819	52 868
Wald χ^2 test of all $\beta = 0$	172.78	210.96	217.74
Likelihood ratio test, $\chi^2(1)$ (H_0: ρ=0)	0.00	0.00	0.00

* Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

I picked Model 3 as the final model that is used to estimate the probability of an imminent executive change after working through various combinations of explanatory variables. The likelihood ratio tests for ρ shows that we cannot confidently reject the null hypothesis of no correlation among the error terms within the respective cross-sectional units. Four consecutive regressions are run to obtain the in-sample estimates for various years. The probability estimates for the years 1985 to 1987 are based on running the random effects probit model up to 1987. The estimates for 1988 to 1990 are obtained by estimating the model up to 1990, and those for 1991 to 1993 by estimating up to 1993. The estimates for 1994 to 1995 are derived from the parameter estimates of Model 3 above (using all the data from 1980 to 1995).

Table 2: Random Effects Probit Results for Change in Executive for Different Periods*

	1980-1987 Model	1980-1990 Model	1980-1993 Model
Revolts	0.1440 (0.2379)	-0.0058 (0.1629)	-0.0439 (0.1396)
Coups	9.0848 (11100000)	9.0549 (11100000)	1.6668** (0.5704)
Cabinet changes	1.5966** (0.1690)	1.6203** (0.1491)	1.6574** (0.1400)
Legislative elections	0.9339** (0.1824)	0.8563** (0.1526)	0.7918** (0.1363)
Democracy	0.3705* (0.2067)	0.2078 (0.1718)	0.3268** (0.1582)
n n*T	54 432	54 594	54 758
Wald χ^2 test of all $\beta = 0$	109.83	150.13	188.73
Likelihood ratio test, $\chi^2(1)$ (H_0: ρ=0)	0.00	0.00	0.00

* Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

I apply the inverse of the cumulative standard normal function to the index represented by the sum of the estimated coefficients multiplied by the corresponding variable values for each observation to get the probability estimates. The resulting probabilities are interpreted as an estimate of the conditional probability that a country will experience a change of its chief executive given its respective values for X_i. Hence, for countries in 1993 to 1995, for example, the calculation would be

$$\text{Probability of executive change} = \Phi^{-1}[\text{constant} - 0.2881*\text{revolts} + 1.9381*\text{coups} + 1.6833*(\text{cabinet changes}) + 0.7586*(\text{legislative elections}) + 0.4121*\text{democracy}]$$

where Φ^{-1} denotes the inverse of the cumulative probability function of the standard normal distribution.

Some of the coefficient estimates do change considerably over time. This justifies running four time-consecutive models to estimate the in-sample probabilities of executive change. The probability of executive change is used in the regressions below as the political instability variable. Political instability is expected to have a negative effect on FDI.

EMPIRICAL ANALYSIS

I use panel data methods to analyze FDI flows in the petroleum industry. However, the fixed effects model would be inappropriate in this case because the past behavior variable has fixed values for each country throughout the entire period under study. The expropriation data is only available up until 1980. Consequently, the

expropriation variable would drop out of the fixed effects estimation when the variables are mean-differenced.

Only the random effects model, therefore, is used

$$y_{it} = x_{it}\beta + u_{it}$$

The compound disturbance term u_{it} incorporates both an individual effects term and a random disturbance term that are independent of each other and among themselves.

$$u_{it} = \alpha_i + \eta_{it}$$

The individual effects term (α_i) is the random effects term, which is a group specific disturbance term that enters the regression identically in each time period for the respective cross-section units. I will also incorporate time-specific effects (γ_t) for each year of the data

$$y_{it} = X_{it}\beta + \gamma_t + \alpha_i + \eta_{it}$$

This is the same model encountered in the sovereign debt issue-area, and I will not explain it in detail again.

It is useful to revisit the arguments listed in Chapter 5 concerning the pros and cons of using the random effects procedure. In this case, I am trying to make inferences about petroleum FDI as a whole but with only data available on U.S. investors, so the sample can be considered as being drawn from a much larger but unobserved population. It is best to treat the individual effects as random in such cases. Moreover, we are

certainly ignorant about the individual effects in the same way as we are ignorant about the error term, so treating α_i as a random variable makes sense.[1]

However, the fixed effects procedure does allow one to eliminate OVB. I will try to compensate by including more structural variables as controls. I include three control variables in the first regression: the average price of a barrel of oil produced by country *i* in year *t* (US$); foreign aid as percentage of central government expenditures; and the gross domestic savings rate (% of GNP). The price data is from *International Energy Annual*, while the data for foreign aid and domestic savings rate are taken from the *World Development Indicators* dataset.

The price is obviously expected to influence investment decisions by U.S. companies. The higher the price of oil, the higher the expected increase in NPPE relative to host country oil output. A host country government that is highly dependent on foreign aid might be more circumspect about expropriating foreign- or U.S.-owned assets because of the danger of retaliation that could reduce or eliminate foreign aid.

The discussion in the last chapter explains how the domestic capital endowment, world interest rate and human capital together influence a host country's payoff from expropriation. The gross domestic savings rate is used as a proxy for the domestic capital endowment. A high savings rate would permit a country to finance domestic investments without recourse to foreign sources, so it would be better able to weather a reduction or cut-off of foreign investment in reaction to an expropriation. Time-specific dummies are included in all the regressions, and they are expected to capture any year-specific effects

[1] Yair Mundlak, "On the Pooling of Time Series and Cross Sectional Data," *Econometrica* 46 (January 1978): pp. 69-86; and G. S. Maddala, "The Use of Variance Components Models in Pooling Cross Section and Time Series Data," *Econometrica* 39 (March 1971): pp. 341-58;

such as the average annual world interest rate. Moreover, the individual effect term should capture country effects such as human capital and managerial expertise.

So I start the analysis with six explanatory variables of interest (other than the individual effect terms and time-specific dummies): price of a barrel of oil from country *i* in year *t*, foreign aid, gross domestic savings rate, one of the two past behavior variables, democracy dummy, and political instability. There are two different groups of regressions, namely one for each past behavior variable.

I begin with the regressions using the number of expropriation acts as the proxy for past behavior (Table 3). All the statistically significant coefficients have the expected signs. The price coefficient is positive and statistically significant at the 95 percent confidence level for all three equations. The democracy dummy and past number of expropriation coefficients are also statistically significant at the 95 percent confidence level for all three equations of the model. The effect of democracy is positive while that of past behavior is negative, as expected. The political instability, aid and gross domestic savings variables are not statistically significant in any of the equations. Furthermore, the three behavioral credibility coefficients are jointly significant at the 5 percent significance level for all equations.

Table 3: Random Effects Regression Results*

Dependent variable is the change in NPPE divided by lagged value of total oil output

	Equation 1	Equation 2	Equation 3
Price per barrel of oil	0.0080**	0.0078**	0.0077**
	(0.0034)	(0.0034)	(0.0033)
Gross domestic savings	-0.0003		
	(0.0007)		
Aid as % of central government expenditures	-0.0004	-0.0005	
	(0.0012)	(0.0012)	

Number of instances of expropriation	-0.0026**	-0.0025**	-0.0025**
	(0.0011)	(0.0011)	(0.0011)
Democracy dummy	0.0245**	0.0235**	0.0244**
	(0.0120)	(0.0117)	(0.0114)
Probability of executive change	0.0380	0.0375	0.0388
	(0.0271)	(0.0269)	(0.0266)
n*T	84	84	84
n	16	16	16
R-squared	0.1623	0.1603	0.1582
Wald-statistic on coefficients presented	11.20	11.16	11.11
Wald-statistic on 3 behavioral credibility coefficients	8.91	8.89	9.79

* Time specific effects are unreported. Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

The next group of regressions uses a dummy variable for past acts of expropriation as the proxy for past behavior (Table 4). All the statistically significant coefficients again have the expected signs. Only the price and expropriation dummy coefficients are statistically significant across all three equations. The price coefficient is positive and statistically significant at the 10 percent significance level for all equations. The expropriation dummy coefficient is statistically significant at the 95 percent confidence level for all three equations of the model. Past behavior, in terms of the expropriation dummy, is negatively correlated with the dependent variable, as expected. The democracy dummy, political instability, aid and gross domestic savings coefficients are not statistically significant in any of the equations. The three behavioral credibility coefficients are jointly significant at the 95 percent confidence level for all equations.

Table 4: Random Effects Regression Results*

Dependent variable is the change in NPPE divided by lagged value of total oil output

	Equation 1	Equation 2	Equation 3
Price per barrel of oil	0.0060*	0.0057*	0.0055*
	(0.0032)	(0.0031)	(0.0031)
Gross domestic savings	-0.0004		
	(0.0007)		
Aid as % of central government expenditures	-0.0005	-0.0006	
	(0.0012)	(0.0012)	
Expropriation dummy	-0.0296**	-0.0282**	-0.0283**
	(0.0140)	(0.0137)	(0.0136)
Democracy dummy	0.0110	0.0105	0.0115
	(0.0125)	(0.0124)	(0.0122)
Probability of executive change	0.0339	0.0332	0.0346
	(0.0269)	(0.0267)	(0.0264)
n*T	84	84	84
n	16	16	16
R-squared	0.1545	0.1513	0.1478
Wald-statistic on coefficients presented	10.45	10.29	10.10
Wald-statistic on 3 behavioral credibility coefficients	8.18	8.04	8.80

* Time specific effects are unreported. Standard errors are in parentheses. Asterisks denotes statistical significance with * for significance at the 90% confidence level and ** for significance at the 95% confidence level.

The R-squared for both groups of regressions are quite low. The explanatory variables (including the year dummies) capture at most sixteen percent of the variation in the dependent variable. The results for FDI are clearly not as robust as those encountered in the sovereign debt issue-area. One major problem is that the dependent variable probably does not fully capture the risk of FDI. Therefore, expropriation risk may not be adequately measured by the dependent variable.

Nevertheless, the regression results confirm the importance of past behavior as a determinant of sovereign credibility in petroleum FDI. There is qualified empirical

support for the hypothesized role of democracy, but the results for my political instability variable are disappointing. However, having the effects of two out of three variables confirmed, albeit in a qualified manner, in an issue–area that is difficult to analyze econometrically is encouraging. These general results are similar to those obtained in the sovereign debt issue-area where past behavior and democracy were found to be significant determinants of sovereign credibility.

The political instability coefficients are again not statistically significant in any of the equations, as in the case of sovereign bank debt. It appears that political instability, at least in terms of the probability of a change in the chief executive, does not influence sovereign behavioral credibility as hypothesized. Foreign investors may not consider executive changes as having a major impact on the discount rate and payoffs of the country. There remains the possibility that other kinds of political variables, for example political polarization, may have an important impact on sovereign credibility in petroleum FDI.

CONCLUSION

FDI expropriation theory offers theoretical support for the role of credibility in the relationship between foreign investors and host countries. A host country lacking the credibility to honor foreign investment contracts and protect the property rights of foreign investors is expected to suffer from less capital inflows than if it were fully credible. There is no self-evident dependent variable to capture the risk profile of FDI, unlike in sovereign debt, so I constructed my own variable. The dependent variable is the change in "Net Plant, Property and Equipment" relative to the lagged total oil output of the host

country. The three factors hypothesized to influence sovereign credibility are again past behavior, degree of democracy and political instability.

Using data on foreign investments in the petroleum industry between 1985 and 1995, the regression analyses support the hypothesis that sovereign behavioral credibility did influence the risk perception on FDI during the period. Past behavior was confirmed as a significant determinant of capital inflows, while some qualified confirmation was found for democracy. The empirical findings on the whole are similar to those encountered in the sovereign bank debt issue-area. The results lend some support to the hypothesis of the existence of sovereign behavioral credibility effects in petroleum industry FDI.

Petroleum FDI summary, 1985-1995

Country	Year	Net Plant, Property, & Equipment ($ million)	Total Oil Output ($ million)
Argentina	1985	358	12737.4
Argentina	1986	363	11553.08
Argentina	1987	354	6976.4
Argentina	1988	404	7004.4
Argentina	1989	429	5943.2
Argentina	1990	466	10505.25
Argentina	1991	478	12488.75
Argentina	1992	565	9290.4
Argentina	1993	623	9979.2
Argentina	1994	687	7982
Argentina	1995	838	11704.55
Canada	1985	12737	35774.72
Canada	1986	13247	31558.34
Canada	1987	14642	21536.05
Canada	1988	22763	26744.8
Canada	1989	25378	15553.2
Canada	1990	24546	23263.94
Canada	1991	23631	29829.96

Canada	1992	19288	18264.9
Canada	1993	17638	26780.05
Canada	1994	17727	20218.68
Canada	1995	16886	29674.2
Colombia	1985	976	4873.44
Colombia	1986	1030	8119.1
Colombia	1987	999	6737.5
Colombia	1988	605	5991.3
Colombia	1989	617	6125.6
Colombia	1990	599	8866
Colombia	1991	671	10454.05
Colombia	1992	1242	6811.09
Colombia	1993	1240	7560.48
Colombia	1994	1304	5274
Colombia	1995	1373	9371.7
Ecuador	1985	125	7727.5
Ecuador	1989	103	3783.24
Ecuador	1990	97	5360.85
Ecuador	1991	83	6838.13
Ecuador	1992	201	4474.74
Ecuador	1993	438	5373.28
Ecuador	1994	631	4234
Ecuador	1995	635	6338.64
Egypt	1985	1377	23239.4
Egypt	1986	1349	21300.6
Egypt	1987	1328	13171.2
Egypt	1988	1314	13652.8
Egypt	1989	1237	11028.75
Egypt	1990	1048	14622.75
Egypt	1991	1020	21194.5
Egypt	1992	1008	13391.2
Egypt	1993	976	13127.5
Egypt	1994	935	9452.8
Egypt	1995	977	13432
Indonesia	1985	4037	39127.25
Indonesia	1986	4306	39656.7
Indonesia	1987	4137	21864.04
Indonesia	1988	4060	23565.52
Indonesia	1989	4253	21839.5
Indonesia	1990	3636	27120.1
Indonesia	1991	4015	42188
Indonesia	1992	4514	28049.6
Indonesia	1993	4649	28860.1
Indonesia	1994	4647	21366.5
Indonesia	1995	5266	25475.85
Libya	1983	560	38840.75

Libya	1984	559	32773.05
Libya	1985	492	31928.85
Libya	1986	270	31175.1
Libya	1987	99	16475.4
Libya	1988	81	21761
Malaysia	1990	1921	12596.65
Malaysia	1991	2189	17829.6
Malaysia	1994	2788	10126.5
Malaysia	1995	2912	12003.2
Mexico	1985	13	79605
Mexico	1986	11	63821.35
Mexico	1987	10	43316
Mexico	1988	10	37252.96
Mexico	1989	10	36615.6
Mexico	1990	10	50804.7
Mexico	1991	15	66464
Mexico	1992	19	42170.2
Mexico	1993	26	46109.25
Mexico	1994	42	31844.1
Mexico	1995	40	41678.56
Nigeria	1985	1213	41860
Nigeria	1986	962	42029.55
Nigeria	1987	793	22971.33
Nigeria	1988	763	27434
Nigeria	1989	689	25825.8
Nigeria	1990	721	38390.1
Nigeria	1991	1015	52597.6
Nigeria	1992	1302	35362.6
Nigeria	1993	1484	36260
Nigeria	1994	1755	26068.5
Nigeria	1995	2293	32186.95
Norway	1985	6004	22458
Norway	1986	5897	23150.7
Norway	1987	6156	17230.92
Norway	1988	5847	20380.8
Norway	1989	5544	24630.9
Norway	1990	5731	35358
Norway	1991	6154	51502.5
Norway	1992	6256	40122
Norway	1993	6650	42652.5
Norway	1994	6437	33277.2
Norway	1995	7267	44149.6
Saudi Arabia	1985	409	98252
Saudi Arabia	1990	90	117944
Saudi Arabia	1991	87	194760
Saudi Arabia	1992	87	132478.8

Saudi Arabia	1993	116	137726.4
Saudi Arabia	1994	105	100688
Saudi Arabia	1995	72	136881.53
Trinidad	1985	423	4845.75
Trinidad	1986	479	4472.16
Trinidad	1987	467	2559.1
Trinidad	1988	435	2449.2
Trinidad	1992	548	2301.6
Trinidad	1993	588	2268
Trinidad	1994	685	1620.96
Trinidad	1995	785	2144.47
UAE	1985	1115	34966.83
UAE	1986	961	37439.5
UAE	1987	830	23962.55
UAE	1988	508	28044.8
UAE	1989	384	25482
UAE	1990	382	40328.85
UAE	1991	343	58814.9
UAE	1992	298	38068.8
UAE	1993	284	39185.85
UAE	1994	285	30899.37
UAE	1995	272	38653.23
United Kingdom	1985	17435	72484.5
United Kingdom	1986	16938	66014
United Kingdom	1987	18356	43909.5
United Kingdom	1988	19580	40176
United Kingdom	1989	18688	28471.6
United Kingdom	1990	24378	38220
United Kingdom	1991	26574	48878.4
United Kingdom	1992	27870	32393.75
United Kingdom	1993	29853	34278.5
United Kingdom	1994	28482	31231.25
United Kingdom	1995	28492	40197.35
Venezuela	1985	77	46754.76
Venezuela	1986	69	48427.7
Venezuela	1987	49	29293.44
Venezuela	1988	86	29915.16
Venezuela	1989	47	23398.89
Venezuela	1990	58	52762.53
Venezuela	1991	93	67972.5
Venezuela	1992	118	46637.57
Venezuela	1993	225	44026.5
Venezuela	1994	311	33566.36
Venezuela	1995	628	45567.5

CONCLUSION

I started out this research project to discuss and empirically verify the existence of sovereign credibility effects in international political economy. The type of commitment relating to credibility that has been the focus of this study is the promise to cooperate given by countries to foreign investors. Although credibility is frequently asserted as an important concern in international relations, empirical examinations of the phenomenon are few and far in between. My dissertation helps us better understand how sovereign credibility works its magic theoretically and what factors play a role in the evaluation of the level of credibility of a particular sovereign agent.

At the beginning, I noted that there are two aspects of credibility: structural credibility and behavioral credibility. Structural credibility is determined by whether an agent has the material interests and resources to discharge a commitment. An agent, however, may be unwilling to fulfill a commitment even though it is able to do so. I termed the willingness aspect of credibility as behavioral credibility. Behavioral credibility, in turn, is posited as a function of three factors: past behavior, political instability, and degree of democracy. I have chosen to focus on sovereign behavioral credibility because it is largely uncharted territory and more interesting from a political science perspective.

Credibility in general is a highly important issue in international relations. Its role is recognized and valued in both security studies and political economy. Credibility facilitates communication and commitment in the anarchic realm of international relations, which is plagued by problems of asymmetric information and lack of third-party enforcement. Deterrence theorists fixate over how commitments can be made

credibly and what types of polities are more credible signalers. War can be averted by making the other party believe that one will indeed carry out a commitment. Institutionalists, on the other hand, argue about how international cooperation can be promoted through openness, repeated and structured interaction, and transparency of dealings and payoffs. Both schools essentially share a key concern with sovereign credibility.

Game theory helps us comprehend how certain conditions in the environment give rise to credibility effects and hence mutual cooperation. There are two environmental conditions that promote credibility formation: frequent and repeated interaction into the distant future, and transparent record of past behavior. These conditions provide incentives and opportunities for mutual cooperation among autonomous agents when there is no "common government" to enforce commitments.

The discounted sum of the stream of payoffs from frequent and repeated interaction into the indeterminate future balances against each agent's individual urge to renege. However, the promised infinite stream of payoffs is not enough by itself. A transparent behavioral record is important in allowing agents to recognize cheaters because it is through the self-policing actions of the agents that mutual cooperation is ultimately maintained. The self-policing behavior of punishing cheaters through ostracism prevents cheaters from the opportunity to renege again and reserves the benefits from cooperation to honest (or cooperating) players. The requirement of self-policing behavior offers a testable hypothesis concerning past behavior. If the sovereign credibility hypothesis is true, then past behavior is expected to play an important role in

determining the behavior of agents when faced with the opportunity of interacting with another agent.

Other than self-policing behavior, it is difficult to generate testable hypotheses from the environmental conditions themselves. Therefore, I turn to the "micro" conditions that may influence a given agent's payoffs and discount factor to produce other testable hypotheses. It is important to note that the correct combination of environmental conditions helps sustain mutual cooperation, but it cannot determine whether a given agent will actually pursue a cooperative strategy. It is internal factors that influence an agent's payoff and discount factor, and hence outsiders' perceptions about that agent. The level of sovereign credibility of particular countries is shaped largely by domestic factors.

Two internal factors that are hypothesized to have an important bearing on sovereign behavioral credibility are political instability and degree of democracy. The baleful effects of political instability on economic growth and policymaking have long been noted by political scientists and economists alike. Unstable governments tend to have short time horizons, and are therefore less mindful of the long-term consequences of their actions. They would be particularly vulnerable to the snares associated with issues that exhibit time inconsistency. Such governments may also lack the political will to pursue disciplined economic policies. Consequently, foreign investors should be wary of unstable governments.

Democracies place greater constraints on state action and are more transparent than non-democracies. Limits on arbitrary state behavior through legal constraints and the ability of the population to penalize state officials reduce the government's ability to act

in an arbitrary manner. The resulting stable property rights not only facilitate economic growth and prosperity, but also protect foreign-owned assets. Moreover, the strong rule of law encountered in institutionalized democracies also helps prevent the government from discriminating against and among foreign investors.

Therefore, the three testable hypotheses in terms of sovereign behavioral credibility are:

H1: Countries that cheated in the past are less credible than countries with a "good" record of past behavior *ceteris paribus*.

H2: Countries experiencing political instability are less credible than politically stable countries *ceteris paribus*.

H3: Democracies are more credible than non-democracies *ceteris paribus*.

The empirical analyses of sovereign behavioral credibility focused on the sovereign bank debt and petroleum industry FDI issue-areas. These two issue-areas were picked for several reasons: availability of data for use in econometric modeling; environmental conditions for credibility formation are satisfied; and the focus on international political economy. Furthermore, the theoretical existence of credibility effects is accepted in both issue-areas, and makes sense intuitively.

There are no international conventions or institutions in either sovereign bank debt or FDI that guarantees the property rights of foreign investors. In other words, there is no tangible international mechanism in either issue-area to ensure that countries adhere

to their commitments. Nevertheless, the inability of governments to commit credibly results in a sub-optimal flow of capital into the country. The lack of third-party enforcement means that foreign investors should be highly attuned and responsive to the level of credibility corresponding to a particular sovereign agent. Therefore, these are two issue-areas where one would expect credibility effects to play very important roles.

The econometric results from the two issue-areas are supportive of the sovereign credibility hypothesis. The impact of past behavior is confirmed by the empirical analyses. It appears that foreign investors in both the sovereign debt and petroleum FDI issue-areas react to past behavior as hypothesized by the theory. This is not surprising as the past behavior hypothesis is the strongest of the three sovereign behavioral credibility hypotheses.

There is also support for the democracy hypothesis, namely that democracies are more credible than non-democracies. The empirical analyses confirm, though in a qualified manner in the petroleum FDI issue-area, that institutionalized democracy leads to greater sovereign credibility. The results for the third hypothesis involving political instability are not encouraging. The political instability variable that I constructed, which aimed to measure the probability of a change in the chief executive, is flawed either in terms of its construction or it is not an appropriate measure of "political instability." I am inclined to believe that the latter is true.

A change in the person of the chief executive does not necessarily foretell major policy adjustments or amendments. The new chief executive could very well be from the same party and/or beholden to the same interests as his/her predecessor. A better measure would be change in the party or political group in power. However, there is no reliable

dataset on changes in the party in power for developing countries that go back to the early 1970s. Another potential "political instability" factor is political polarization. The argument here is that partisan governments in societies that are highly polarized politically pursue divergent policies that are myopic and serve only the short-term interests of the narrow group to which the party in party is beholden. The frequent changes in policies caused by different successive partisan governments may destabilize the economy, and hence frighten foreign investors.[1] This line of reasoning obviously depends on a democratic form of government where different political parties have opportunities to alternate in power. These two components of political volatility point to future lines of research.

So in the end, two of the three individual hypotheses are confirmed. Past behavior and democracy are found to influence outside perceptions about a country's ability and willingness to fulfill a commitment. The confirmation of these two hypotheses also point to confirmation of the main overarching hypothesis, namely that sovereign behavioral credibility influences external perceptions of country risk. Both past behavior and democracy individually affect the risk perception of foreign investors in the expected direction. Moreover, all three behavioral credibility variables are jointly significant in all the regressions.

The overall conclusion is highly encouraging and heartening. It shows that sovereign behavioral credibility affects the risk perception of outside observers about a given country. I have demonstrated at the very least that behavioral credibility can be examined empirically, and hope that more empirical analyses of sovereign credibility will

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[1] See Alberto Alesina, "Politics and Business Cycles in Industrial Democracies," *Economic* Policy 8 (April 1989): pp. 78-83.

be undertaken in the near future. More empirical research is clearly required to fully illuminate the impact and role of credibility in international relations. This study has shed some tentative light on the subject.

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