Sovereign Theft: Theory and Evidence about Sovereign Default and Expropriation[1]

Michael Tomz[2] and Mark L. J. Wright[3]

August 31, 2009

[1]Forthcoming in *The Natural Resources Trap: Private Investment without Public Commitment*, eds. William Hogan and Federico Sturzenegger, Cambridge, MA: MIT Press, 2010. For helpful comments we thank William Hogan, Stephen Kaplan, Thomas Plümper, Federico Sturzenegger, Christoph Trebesch, and Jeromin Zettelmeyer. We are grateful for financial support from the Stanford Center for International Development and the National Science Foundation (CAREER Grant SES-0548285).

[2]Associate Professor, Department of Political Science, Stanford University. Email: tomz@stanford.edu.

[3]Assistant Professor, Department of Economics, University of California, Los Angeles. Email: mlwright@econ.ucla.edu.

Abstract

This paper examines two major risks to foreign investors: default on sovereign debt and expropriation of foreign direct investment, which we refer to collectively as "sovereign theft." Using a series of formal models, we analyze how the incentives to engage in sovereign theft vary with the state of the economy, the risk aversion of political leaders, and the nature of punishments for default and expropriation. We then document patterns of sovereign theft and foreign investment across much of the twentieth century. Our research, based on a new data set, reveals a striking asynchronicity: defaults and expropriations have occurred in alternating, rather than coincident, waves. Our findings shed new light on the possibility of reputational spillovers across issues, and on sources of cooperation and con‡ict in the international economy.

All investments are subject to political risk: the possibility that, after investments have been sunk, governments will enact policies that reduce the payoffs to investors. Political risk is particularly severe in the case of foreign investments, where the absence of supranational courts limits legal remedies and where an investor's foreign nationality limits redress through domestic political institutions.

In this chapter we study the most extreme forms of political risk (default and expropriation, which we refer to collectively as *sovereign theft*) and their effect on the two most important forms of foreign investment (sovereign debt and direct investment). We first review the theoretical literature about sovereign theft. We then use a series of formal models to analyze how the incentives to engage in sovereign theft vary with the state of the economy, the risk aversion of political leaders, and the nature of punishments for default and expropriation.

Finally, we document patterns of sovereign theft and foreign investment across much of the twentieth century. Our research, based on a new data set, reveals a striking asynchronicity: defaults and expropriations have occurred in alternating, rather than coincident, waves. We further show that the overall level of foreign investment has increased, but the composition has alternated between debt and direct investment. We conclude by discussing the implications of our theoretical and empirical work for future research about sovereign theft.

3.1 THEORETICAL PERSPECTIVES ON SOVEREIGN THEFT

When deciding whether to engage in sovereign theft, a government must weigh the benefits of taking resources from investors against the potential costs, such as a loss of access to future investments or exposure to other penalties. The balance of costs and benefits will depend on the type of investment, as well as on the economic and political circumstances the government faces. In this section we provide a nontechnical review of the theoretical literature about the incentives to default on foreign debts and/or expropriate the assets of direct investors. In the following section we offer a more technical analysis, based on a suite of formal models.

3.1.1 The Short-Run Benefits of Sovereign Theft

A simple debt contract specifies a fixed return that investors are entitled to receive, whereas a simple equity contract specifies a variable return that is proportional to the profits from the enterprise. In practice, debt and equity contracts come in more elaborate forms. This is particularly true of international bonds, which may be issued in different currencies and at different maturities, may be indexed to inflation, and may even specify that returns should vary with commodity prices or the gross domestic product of the economy (for example, the Brady bonds of Mexico and Bulgaria, or the Argentine bonds that were restructured in 2005). Likewise, equity contracts may vary in the details by which investors and the host country share revenues and costs. Notwithstanding this rich variation, one can gain valuable insights by examining debt and equity contracts in their purest forms.

First consider a simple debt contract, which requires the country to pay a fixed amount no matter whether economic times are good or bad. Leaders will be most tempted to default on such a contract when their value for resources is highest. During a recession, for example, tax revenues are often low, and residents of the country often place a heavy burden on the welfare state. In hard times like these, political leaders need resources and might be especially inclined to withhold interest and principal from foreigners.

The incentives to engage in sovereign theft are somewhat different with equity contracts. Suppose that a project financed by foreign direct investment (FDI) has returns that correlate perfectly with the business cycle. The desire to expropriate is then determined by a trade-off between two forces: "desperation" and "opportunism" (Cole and English 1991). If leaders place a high value on resources in recessions, they will be most tempted to expropriate out of desperation during recessions, even though the required payments to foreign investors would be lowest at those times. If, on the other hand, the leaders value resources in recessions about the same as in booms, they will be most tempted to expropriate opportunistically in booms when payments to investors (and hence the amount to be gained from expropriation) would be highest. As we show formally below, the trade-off between desperation and opportunism depends crucially on the risk aversion of political leaders.

3.1.2 The Long-Run Benefits of Sovereign Theft

The benefits of sovereign theft typically extend beyond the period in which the theft occurs. By defaulting completely on a debt contract, the country can gain all interest and principal

payments that were scheduled to have occurred in the future; by completely expropriating direct investments, the country can appropriate the future stream of revenues that would otherwise have gone to foreign investors.

The long-run benefits of sovereign theft depend, however, on the nature of the investment. Direct investments, unlike loans, typically involve some transfer of control over the operations of the project and some transfer of complementary goods, assets, or factors of production from foreign investors to the host country. Some of these transfers are irrevocable. For example, once the domestic workforce has been trained to operate the project, it may continue long after the direct investor has departed. In this case, the future gains from expropriation can be large. Other transfers must occur repeatedly. A project may, for example, require goods from some other arm of the multinational firm or managerial inputs that are vested in foreign employees. When factors of production must be sent repeatedly, expropriation will significantly reduce the value of the project, especially if disgruntled foreign investors deny access to these factors and the factors are not available from other sources.[1]

3.1.3 The Costs of Sovereign Theft: Loss of Access to Future Investments

We have considered the principal benefit of sovereign theft: the country can retain resources it otherwise would have paid to foreigners. If there were no costs to sovereign theft, countries would always default on debts and expropriate foreign direct investments, and consequently we would never observe foreign investments of any kind. There is substantial disagreement

among scholars about the costs of sovereign theft. Indeed, some authors have posed this as a puzzle: Why do we ever observe foreign investments in practice?

Perhaps countries honor their contracts to preserve access to future investments. They might, for example, fear that sovereign theft would trigger *retribution*, in which investors would withhold funds in order to punish the country for breaking the contract. Eaton and Gersovitz (1981b) formalized this idea in the context of sovereign borrowing. They modeled a repeated game in which lenders deterred the sovereign from defaulting by threatening to retaliate against a single act of default by permanently excluding the perpetrator from future borrowing. Other authors have used similar logic to explain why countries refrain from expropriating direct investments (e.g., Cole and English 1991, 1992a, 1992b; Albuquerque 2003).[2]

It is not obvious that the threat of permanent exclusion from future investments would be credible, however. If a country is excluded from capital markets, potential gains from trade are being left unexploited. Investors other than the party that was directly affected by the act of sovereign theft might, therefore, be tempted to cooperate with the country, instead of participating in the punitive embargo. Bulow and Rogoff (1989b) showed, for example, that a country could take the payments it would have made to foreign lenders and invest them with foreign financial institutions in such a way as to duplicate the gains it could have attained from future borrowing. To avoid the costs of default, then, the country need not convince foreign creditors to lend; it only need to convince financiers to accept deposits.

A growing literature establishes the limitations of the Bulow-Rogoff critique. As Kletzer and Wright (2000) show, limits on the ability of financial institutions in creditor countries

to guarantee repayment can restore the threat of exclusion. Wright (2001) finds conditions under which even competitive financial institutions (in the sense of making zero profits in equilibrium) can coordinate to exclude a defaulter from access to all capital markets. Amador (2004) adds that leaders in politically unstable countries may be unwilling to save in ways that would help them evade punishment for default. Foreign direct investment may be even less vulnerable to the Bulow-Rogoff critique. As already noted, direct investments often involve the transfer of skills and factors of production. If these are in limited supply, competitors may not be able to undermine the threat of exclusion, and hence the threat may be effective in deterring expropriation.

Sovereign theft might not only trigger retribution but also sully a country's *reputation*. International investments take place in a context of incomplete information, in which investors cannot fully know the preferences of foreign governments. If a government engages in sovereign theft, foreigners may infer that the government is a "bad type" that assigns a low value to future loans and good relations with foreign investors. Having learned about the government's preferences, foreigners refrain from making new investments, not because they are participating in a coordinated retaliatory embargo, but simply because they now think that further investment would be a money-losing proposition. Given what they know about the government's type, the risk of sovereign theft would be too great to warrant future investment (see, for example, Cole, Dow, and English 1995; Sandleris 2008; and Tomz 2007, with the latter documenting the importance of reputation throughout history).

Some models emphasize the possibility of reputational spillovers: a government's behavior in one area of world affairs could reveal its type more generally, thereby affecting all its

international relations (Cole and Kehoe 1998; Rose and Spiegel 2009). Such models predict that a government should commit all acts of sovereign theft simultaneously, instead of spacing them across time. Essentially, there is no reason to continue repaying debts in the hope of preserving a good reputation if, by expropriating foreign direct investments, a government has already revealed itself to be unreliable. The country should expropriate and default at the same time to get the maximum benefit for the same reputational cost. Other models allow defaults and expropriations to signal different things about the government, such that defaults and expropriations need not coincide.

3.1.4 The Costs of Sovereign Theft: Other Considerations

Sovereign theft could entail other costs, beyond the loss of access to future investments. Kaletsky (1985) and Bulow and Rogoff (1989a) suggest that sovereign theft could trigger direct sanctions, such as trade embargoes or gunboat diplomacy. Rose (2005) finds that countries that defaulted on their debts experienced a decline in foreign trade, perhaps because creditors were imposing trade sanctions. Mitchener and Weidenmier (forthcoming) and Ahmed, Alfaro, and Maurer (2007) add that during the nineteenth and early twentieth centuries, creditors used the threat of military retaliation to deter countries from defaulting. These views remain controversial, however. Martinez and Sandleris (2008) show that the trade declines identified by Rose (2005) are unrelated to the pattern of creditor holdings of debt. Moreover, in a study of sovereign debt across three centuries, Tomz (2007) finds no evidence that trade sanctions were explicitly used to punish defaulters and uncovers little

proof that creditors ever used—or even threatened to use—military intervention to enforce debt contracts.

Would the prospect of direct sanctions be more effective in protecting foreign direct investment than in compelling countries to honor debt contracts? Much depends on who owns the debt versus the direct investment. If a sovereign government owes debts to other governments or to supranational institutions, as is sometimes the case today, it seems plausible that those public creditors would apply diplomatic or commercial sanctions in response to default. It is less obvious that governments would take military or commercial action against countries that reneged on contracts with private citizens. Research by Platt (1968) and Tomz (2007) shows that, before World War II, governments occasionally used force to help private citizens recover their foreign direct investments, but they did not take similarly punitive steps to assist holders of foreign government bonds.

Counterbalancing the possibility of direct sanctions, there may be sizable direct benefits to developing countries that expropriate foreign investments in politically sensitive natural resource projects, where nationalist sentiment often makes foreign investment unwelcome. Domínguez (1982), for example, documents the tide of "business nationalism" that contributed to expropriations in Latin America during the 1970s.

Finally, the liquidity of investments may affect the costs of sovereign theft. Broner, Martin, and Ventura (2006) have argued that the development of liquid secondary markets in debt may reduce a country's temptation to default. If, through the operation of secondary markets, debts that were once owned by foreigners become the property of citizens in the borrowing state, the government may be reluctant to default, since such action would hurt

its own constituents. Provided that debts are more liquid than direct investment (see Fernández-Arias and Hausmann 2001, Hausmann and Fernández-Arias 2001), debts might be less vulnerable to sovereign theft. Spiegel (1994), however, has argued the opposite: that direct investments have a liquidity advantage and are, therefore, more secure vehicles for international capital.

In summary, the costs and benefits of sovereign theft are likely to vary with economic and political conditions, and with the type of foreign investment. We explore these differences formally in the next section.

3.2 MODELS OF SOVEREIGN THEFT

We model relations between international investors and a country that needs foreign capital for production. The decisions of the country's residents are assumed to be captured by the decisions of a representative agent who is risk averse, and may, therefore, seek foreign funds not only to increase production but also to insure against production risk. We develop several models that differ according to the assets through which the country can access international financial markets and the punishments the country would suffer for breach of contract. All the models share several basic features, which we now outline.

3.2.1 Assumptions in All the Models

Consider a small open economy with a production opportunity that requires foreign capital. Investing k units of foreign capital produces $\theta f(k)$ units of output. Here f is a standard

neoclassical production function that is bounded, strictly increasing, and strictly concave in k, and $\theta > 0$ is a random productivity shock with probability density function $g(\theta)$. The function $g(\theta)$ is common knowledge, but the realization of θ is not known to either the country or to international investors at the time investments take place. Thus, investments in the country are intrinsically risky, independent of any potential for sovereign theft.

The country's representative agent is risk averse and evaluates consumption levels according to a strictly increasing and strictly concave utility function, $U(c)$. As long as contracts are honored, the country will be rewarded with an extra utility prize P that depends on the investment environment and represents the benefits associated with honoring contracts (e.g., future access to foreign finance and trade, and favorable diplomatic relations with creditor countries).

The country can obtain capital from a large group of risk neutral international investors. Competition among members of this group ensures that they earn, on average, no more than the opportunity cost of their funds, which is given by the constant international interest rate r^w. The models that follow differ in the limitations, if any, on the country's ability to interact with international investors.

3.2.2 First-Best Contracts

Suppose the country could commit to honoring all possible contracts, including but not limited to debts and direct investments. In this case, investment will be at the *first-best level*, which maximizes the expected value of production less the opportunity cost of funds

to international investors. That is, the first-best level of investment, k^{FB}, solves

$$1 + r^w = E[\theta] f'\left(k^{FB}\right),$$

where E is an expectation operator that captures the expected value of the productivity shock θ. This equation says that in a first-best world, investment occurs up to the point where the expected marginal product of investment equals the gross world interest rate.

Under the assumption that international capital markets are competitive, the country retains all gains from dealing with foreign investors and can insure itself perfectly against fluctuations in production. It therefore earns the certain return (measured in utility units) of

$$U^{FB} = U\left(E[\theta] f\left(k^{FB}\right) - \left(1 + r^w\right) k^{FB}\right).$$

In what follows, we examine how limitations on the assets available to the country, and on the country's ability to commit to honoring contracts, affect the level of investment and the country's welfare.

3.2.3 Defaultable Debt

Suppose the only asset available to the country is defaultable debt. That is, the country can raise capital only by issuing an amount b of zero-coupon bonds at price $q(b)$ per bond, where q is a function of b. The capital the country receives from issuing these bonds, $k = bq(b)$, can be invested in the project. At the end of the period, the country chooses whether to

honor the contract by paying the non-state-contingent amount b to investors, or to default completely and retain all resources for itself.

If the country repays the debt, it consumes $\theta f(k) - b$ and also receives a utility prize P^D for maintaining good relations with lenders. If, on the other hand, the country defaults, it consumes the entire output $\theta f(k)$ but forgoes the utility prize P^D. As a result, after observing the productivity shock θ, the country defaults if

$$U(\theta f(k)) > U(\theta f(k) - b) + P^D.$$

The bond price $q(b)$ is determined by competition in the capital market and reflects expectations about the likelihood of default. Denote the probability of default as

$$\pi(b) = \Pr\left\{\theta | U(\theta f(bq(b))) > U(\theta f(bq(b)) - b) + P^D\right\},$$

where we have substituted $bq(b)$ for k to make clear that the probability of default depends on b, the size of the promised repayment.

Investors will demand a price $q(b)$ that makes them indifferent between lending to the country and receiving b with probability $1 - \pi(b)$, versus investing in an alternative asset that pays $(1 + r^w)k$ with certainty. Setting these quantities equal to each other and solving for $q(b)$, we get

$$q(b) = \frac{1 - \pi(b)}{1 + r^w}.$$

The country chooses b (which implies a level of k), taking into account b's effect on the price

of the bonds.

This model belongs to the class of defaultable debt models introduced by Eaton and Gersovitz (1981b) and exploited by Arellano (2008), Aguiar and Gopinath (2006), and Tomz and Wright (2007), among others. In contrast to these models, it adds production—as opposed to just consumption smoothing—as a motivation for international borrowing. For simplicity, the direct utility benefit of repayment is taken as exogenous, unlike in the papers by Yue (2006), Pitchford and Wright (2007), and Benjamin and Wright (2009), who model these payments as the outcome of bargaining between creditors and debtors.

We solve the model numerically using a version of the following algorithm:

Algorithm 1 *(Defaultable Debt Model)*

1. *For every promised repayment b, every bond price q, and every productivity realization θ, compute whether it is optimal for the country to default.*

2. *Given the result of step 1, compute the expected return to the investor (averaging over the probability distribution of θ) for each combination of b and q.*

3. *Find the combination of b and q that maximizes the expected utility of the debtor country,*

$$E\left[\max\left\{U\left(\theta f\left(bq\right)\right), U\left(\theta f\left(bq\right)-b\right)+P^{D}\right\}\right],$$

subject to the constraint that the combination gives the investor an expected return at least as large as the risk-free rate.

For this model, we have found that our algorithm converges faster than the usual iterative

method, even when implemented on very fine grids of possible promised repayments.

3.2.4 Expropriable Direct Investment

The previous model assumed that the country could obtain foreign capital only by borrowing. Suppose instead that the country's only option is to sell an equity stake that entitles investors to a proportion α of net output. The country will expropriate the equity stake if

$$U\left(\theta f\left(k\right)\right) > U\left(\left(1-\alpha\right)\theta f\left(k\right)\right) + P^{E},$$

where P^{E} represents the direct prize from honoring equity contracts. This prize may differ from P^{D} if, for example, a direct investor contributes factors to the production process that make the project less valuable in the event of an expropriation.

Let Θ^{*} be the set of all θ such that the contracts are not expropriated. In equilibrium, the shareholding α necessary to raise k resources must satisfy

$$\left(1+r^{w}\right)k = \alpha f\left(k\right)\int_{\Theta^{*}} \theta g\left(\theta\right)d\theta,$$

in order to ensure that foreign investors break even.

As with the defaultable debt model, we solve the expropriable direct investment model numerically using a grid-search algorithm.

Algorithm 2 *(Expropriable Direct Investment Model)*

1. *For every level of capital k, every shareholding proportion α, and every productivity*

realization θ, compute whether it is optimal for the country to expropriate.

2. *Given the result of step 1, compute the expected return to the investor (averaging over the probability distribution of θ) for each combination of k and α.*

3. *Choose the combination of k and α that maximizes the expected utility of the debtor country,*

$$E\left[\max\left\{U\left(\theta f\left(k\right)\right), U\left(\left(1-\alpha\right)\theta f\left(k\right)\right)+P^{E}\right\}\right],$$

subject to the constraint that the combination gives the investor an expected return at least as large as the risk-free rate.

3.2.5 Defaultable Debt and Expropriable Direct Investment

Having considered scenarios in which the country can issue either defaultable debt or expropriable equity, we now develop a model in which the country can issue both. This allows us to consider the optimal mix of debt and equity, and how the mix evolves in response to the economic and political environment.

To create room for both debt and equity, we need to specify the timing with which different types of capital are raised and repaid (or not). We assume that direct investments occur before loans are contracted, and that loans are repaid before profits are distributed to direct investors. The resulting environment, in which decisions are taken in successive stages, is displayed in figure 3.1. First, an amount of capital k_1 is raised by issuing shares that entitle direct investors to a proportion α of the profit from the project. Next, more

capital k_2 is raised by issuing debt (a promise to repay b at the end of the project) at bond price q. The total, $k_1 + k_2$, is devoted to production. The production shock θ is then observed, and production $\theta f(k_1 + k_2)$ is realized. The country next decides whether to default on its debts, and finally chooses whether to expropriate the earnings of direct investors. The size of the "prize" associated with honoring contracts is P^{DE} if the country repays both debt and equity, and is either P^D or P^E if only one of the two contracts is upheld. If neither contract is honored, the country receives no prize.

[figure 3.1 here]

The model is solved by backward induction. Consider the decision of a country that has already defaulted and is now weighing whether to expropriate the equity stake of foreign direct investors. At this stage of the game (stage A in figure 3.1), the country expropriates if and only if

$$U(\theta f(k_1 + k_2)) > U((1-\alpha)\theta f(k_1 + k_2)) + P^E.$$

Let

$$V^A(\theta, k_1, k_2, \alpha) = \max\left\{U(\theta f(k_1 + k_2)), U((1-\alpha)\theta f(k_1 + k_2)) + P^E\right\},$$

be the optimum value to the country from ending up at stage A, and let $\phi^A(\theta, k_1, k_2, \alpha)$ be an indicator function for an expropriation at this stage in state θ.

Next consider a country that has not defaulted and must decide whether to expropriate (stage B in figure 3.1). If the country expropriates, it receives the total output net of the repayment of debt, $\theta f(k_1 + k_2) - b$,whereas if it honors the direct investment contract it

receives a fraction $1-\alpha$ of this amount. Hence, a country at stage B expropriates if and only if

$$U\left(\theta f\left(k_1+k_2\right)-b\right)+P^D>U\left(\left(1-\alpha\right)\left[\theta f\left(k_1+k_2\right)-b\right]\right)+P^{DE}.$$

Let

$$V^B\left(\theta,k_1,k_2,\alpha,b\right)=\max\left\{U\left(\theta f\left(k_1+k_2\right)-b\right)+P^D,U\left(\left(1-\alpha\right)\left[\theta f\left(k_1+k_2\right)-b\right]\right)+P^{DE}\right\}$$

be the optimum value to the country from stage B, and let $\phi^B\left(\theta,k_1,k_2,\alpha,b\right)$ be an indicator function for expropriation at that stage in state θ.

Working backward, consider the country's decision to default or not (stage C). If it repays its debts, it gives up b resources today and moves on to stage B; if it defaults, it keeps those resources and moves on to stage A. Hence, a country in state θ defaults if and only if

$$V^A\left(\theta,k_1,k_2,\alpha\right)>V^B\left(\theta,k_1,k_2,\alpha,b\right).$$

The value to the country from choosing optimally at stage C is, therefore,

$$V^C\left(\theta,k_1,k_2,\alpha,b\right)=\max\left\{V^A\left(\theta,k_1,k_2,\alpha\right),V^B\left(\theta,k_1,k_2,\alpha,b\right)\right\}.$$

If $\phi^C\left(\theta,k_1,k_2,\alpha,b\right)$ is an indicator function for default at stage C in state θ, then the

probability that the country defaults is

$$\pi\left(k_1, k_2, \alpha, b\right) = \int \phi^C\left(\theta, k_1, k_2, \alpha, b\right) g\left(\theta\right) d\theta,$$

where $g\left(\theta\right)$ is the probability density of θ.

Next consider stage D, where the country can issue some amount of debt b at price $q\left(b; k_1, \alpha\right)$, where q is set taking into account not only b but also the direct investment contract, if any, that exists when loans are raised. At this point, the country has not observed the outcome of the production shock, θ, and hence must maximize its expected payoffs. The optimum value to the country at stage D is

$$V^D\left(k_1, \alpha\right) = \max_b \int V^C\left(\theta, k_1, bq\left(b; k_1, \alpha\right), \alpha, b\right) g\left(\theta\right) d\theta,$$

where we have replaced the amount the country has borrowed, k_2, with $bq\left(b; k_1, \alpha\right)$. Denote the level of capital raised through debt issuance, as a function of k_1 and α, as $k_2^*\left(k_1, \alpha\right)$.

Competition among lenders implies that the bond price satisfies

$$\begin{aligned} q\left(b; k_1, \alpha\right) &= \frac{1 - \pi\left(k_1, k_2, \alpha, b\right)}{1 + r^w} \\ &= \frac{1 - \pi\left(k_1, bq\left(b; k_1, \alpha\right), \alpha, q\right)}{1 + r^w} \end{aligned}$$

where r^w is the risk-free world interest rate. Note the self-referential nature of this equation: bond prices affect the probability of default, which in turn affects bond prices. This opens the possibility of multiple equilibria.

At stage E, the starting point of the game, equity is issued to maximize the country's welfare, $V^E(k_1, \alpha(k_1))$,where α, now expressed as a function of k_1, is determined by competition among equity investors. That is, $\alpha(k_1)$ must solve

$$\begin{aligned}(1+r^w)\,k_1 &= \alpha(k_1)\int \left\{\phi^C(\theta,.)\left(1-\phi^A(\theta,.)\right)\theta f\left(k_1+k_2^*(k_1)\right)+\right.\\ &\qquad \left.\left(1-\phi^C(\theta,.)\right)\left(1-\phi^B(\theta,.)\right)\left[\theta f\left(k_1+k_2^*(k_1)\right)-b\right]\right\} g(\theta)\,d\theta,\end{aligned}$$

where we have suppressed the arguments of the $\phi's$ for simplicity.

This model is more complex than the previous two, because it combines elements of each. It is solved by the following algorithm:

Algorithm 3 *(Combined Model: Defaultable Debt and Expropriable Direct Investment)*

1. *For every level of capital raised from foreign direct investment k_1, every shareholding level α, every promised debt repayment b, every bond price q, and every productivity realization θ, compute whether it is optimal for the country to*

   (a) *Default on its debts and expropriate foreign direct investments;*

   (b) *Default on its debts and honor its foreign direct investments;*

   (c) *Repay its debts and expropriate its foreign direct investments; or*

   (d) *Repay its debts and honor its foreign direct investments.*

2. *Given the result of step 1, compute the expected return to a bondholder, and to a foreign direct investor, for each combination of k_1, α, b, and q.*

3. *Find the combination of k_1, α, b, and q that maximizes the expected utility of the debtor country,*

$$E\left[\max\left\{U\left(\theta f\left(k_1+qb\right)\right), U\left(\left(1-\alpha\right)\theta f\left(k_1+qb\right)\right)+P^E,\right.\right.$$
$$\left.\left.U\left(\theta f\left(k_1+qb\right)-b\right)+P^D, U\left(\left(1-\alpha\right)\theta f\left(k_1+qb\right)-b\right)+P^{DE}\right\}\right],$$

subject to the constraint that foreign direct investors and bondholders each earn an expected return at least as large as the risk-free rate.

3.3 ANALYSIS OF THE MODELS

In this section we use the defaultable debt model, the expropriable direct investment model, and the combined model to study the incentives of sovereign governments and foreign investors. We show how the temptation to engage in sovereign theft (and hence the willingness of foreigners to make investments) varies with the state of the economy, the risk aversion of decision makers, and the nature of the prizes for respecting contracts.

3.3.1 Defaultable Debt vs. Expropriable Direct Investment

When the only source of foreign investment is defaultable debt, sovereign theft should be more likely to occur in bad times than in good ones. Recall that the country's utility function, U, is strictly concave and that the promised debt repayment, b, must be greater than or equal to zero. It follows that, if a country defaults at some productivity level θ^*,

it will default for all $\theta < \theta^*$. This result holds for all countries, regardless of the leader's attitude toward risk.

In the direct investment model, by contrast, the effect of economic conditions on sovereign theft depends on the risk aversion of leaders. Recall that expropriation occurs when

$$U\left(\theta f\left(k\right)\right) > U\left(\left(1-\alpha\right)\theta f\left(k\right)\right) + P^E.$$

Suppose the country has a constant relative risk aversion (CRRA) utility function

$$U\left(c\right) = \begin{cases} \frac{c^{1-\sigma}}{1-\sigma}, & \text{for } \sigma > 0, \sigma \neq 1 \\ \log c & \text{for } \sigma = 1. \end{cases}$$

If $\sigma \neq 1$, then, the country will expropriate if

$$\theta^{1-\sigma} > \frac{\left(1-\sigma\right)P^E}{\left[1-\left(1-\alpha\right)^{1-\sigma}\right]f\left(k\right)^{1-\sigma}}.$$

This inequality formally establishes the aforementioned trade-off between "desperation" and "opportunism" (Cole and English 1991).[3] The left side of the inequality is decreasing in θ when $\sigma > 1$ but is increasing in θ when $\sigma < 1$. Thus, highly risk-averse leaders (leaders with $\sigma > 1$), who are very reluctant to forgo consumption when output is low, will expropriate out of desperation when θ is small. In contrast, leaders who are not especially risk averse (e.g., ones with $\sigma < 1$) will expropriate shareholdings opportunistically when θ is high. In the intermediate case of $\sigma = 1$, these two forces exactly balance and offset,

making the decision to expropriate independent of θ.

These results highlight important similarities and differences between sovereign debt and direct investment. When leaders are relatively risk averse, debt and equity are similar in the sense that leaders are most tempted to engage in sovereign theft when output is low. When leaders are relatively neutral about risk, though, the two types of investments differ: leaders remain most likely to default when output is low, but they are least likely to expropriate in those same situations.

To illustrate these patterns and obtain other results, we assign values to parameters and solve the models numerically. Let the production function be Cobb-Douglas, such that

$$f(k) = k^{\eta},$$

where η, the output elasticity of capital, takes on a standard value of 1/3. Suppose the productivity level θ follows a discrete-state approximation to a lognormal distribution with coefficient of variation equal to 10 percent. Finally, let the world interest rate r^w be 5 percent. In the analyses that follow, we vary either the risk aversion of leaders or the rewards for honoring contracts.

Figures 3.2a–3.2d display the effect of risk aversion on country-investor relations when only one type of capital—either a loan or a direct investment—is available. To construct the figures, we varied the coefficient of relative risk aversion, σ, from a nearly risk neutral value of 1/5 to a highly risk-averse value of 5. We further set the prize for respecting each type of contract at 35 percent of the first-best utility value, U^{FB}, scaled by $(1 - \sigma)$ to ensure

positive prizes.

[figures 3.2a–3.2d here]

Figure 3.2a shows, for each value of σ, the set of productivity levels (θ's) at which the country would find it optimal to default. When σ is small, the country has little desire to smooth its consumption and engages in sovereign theft only in the most adverse states of the world, when productivity levels are at a minimum. As σ rises, the country becomes more risk averse and therefore less tolerant of repaying during bad times. Investors respond by increasing interest rates, further heightening the incentive to default. Eventually, at a coefficient of relative risk aversion of just under 4, default occurs in all states and the market for debt shuts down.

Figure 3.2b plots the analogous set of circumstances under which the country would expropriate. Consistent with the analytical derivations, expropriations occur in good times when the country is relatively risk tolerant and in bad times when the country is relatively risk averse. Consequently, the probability of expropriation (see figure 3.2c) is non-monotonic, falling as σ climbs toward one and rising thereafter, whereas the probability of default increases steadily with σ.

Moreover, the probability of default exceeds the probability of expropriation for all but the lowest values of σ. There are two reasons why a relatively risk-averse leader would be more likely to default than to expropriate in bad states of the world. The main reason is that, during hard times, debt contracts afford the country less slack than equity contracts. Simple debt contracts require the same payment regardless of circumstances, whereas equity

contracts require smaller payments when productivity is low.

The second reason is more indirect and subtle. In bad times, debt contracts stipulate larger repayments than equity contracts. When sovereign theft occurs, therefore, lenders forgo more (relative to what they were promised) than direct investors. Knowing this, lenders demand much higher interest rates to compensate for the risk of default, whereas direct investors require only a slightly larger shareholding to indemnify themselves against the risk of expropriation. Because the average repayment rises faster for debt than for equity, the temptation to default increases faster than the temptation to expropriate.

What implications do these findings have for the level of investment? Figure 3.2d displays investment as a proportion of the first-best amount, k^{FB}, for different values of σ. Again, the pattern for direct investment is nonmonotonic, with the largest investments when σ is close to one. The money the country receives from lenders, on the other hand, declines with σ.

These patterns have implications for the welfare of countries. Unless leaders are nearly risk neutral , they can obtain more investment in the FDI-only world than in the debt-only world, because leaders are less willing to expropriate than to default for these parameter values. The relationship reverses for highly risk-tolerant leaders (ones with $\sigma < 1/2$); such leaders can raise more money from a world of lenders than from a world of direct investors. Relative welfare follows a similar pattern: risk-averse leaders achieve higher welfare in the equity-only world than in the debt-only world, whereas the opposite is true for leaders who are fairly neutral about risk.

Our findings deepen a well-known puzzle about international finance. Levels of inter-

national debt typically exceed levels of direct investment. Scholars have argued that this pattern is not optimal for insuring countries against production risk. After all, equity contracts by their very nature are state-contingent, whereas debt contracts typically are not. Our analysis reinforces this puzzle. In a world where risk-averse countries cannot commit to honoring their contracts, an equity-only environment should lead to more investment than a debt-only environment. Equity investors should be willing to supply this additional capital because, in bad states, the probability of expropriation is lower than the probability of default. Our results thus make the prevalence of debt over equity even more puzzling.

Investor-government relations depend not only on risk aversion but also on the prize for honoring contracts, as shown in Figures 3.3a–3.3d. To construct these figures, we set $\sigma = 2$ and varied the prize for repaying debts in the debt-only model or the prize for eschewing expropriation in the FDI-only model from 5 to 45 percent of our benchmark level, $(1 - \sigma)U^{FB}$. Recall that, when $\sigma > 1$, both the debt-only and the FDI-only models predict that governments will honor contracts in good times but practice sovereign theft in bad times. Figures 3.3a and 3.3b illustrate this prediction, while also demonstrating that sovereign theft occurs in fewer states of the world as the prize for honoring contracts increases.

[figures 3a–3d here]

Interestingly, our simulations show that, for any given prize, default is more common (occurs for a larger set of θ's) than expropriation. Figure 3.3c shows this explicitly: at each prize level, the probability of default exceeds the probability of expropriation. A given prize

should, therefore, support more FDI than loans. Figure 3.3d confirms this prediction. Once the prize exceeds about 30 percent of the benchmark level, the incentive to expropriate disappears and the amount of direct investment approximates the first-best level that the country would attain if it could commit to honoring all contracts. In contrast, loans never rise to the first-best level for the range of prizes displayed in figure 3.3d. It is, therefore, even more puzzling why debt levels have historically exceeded direct investment levels.

3.3.2 Defaultable Debt *and* Expropriable Direct Investment

To analyze the combined model, one must specify a relationship between the prize from not defaulting on debt and the prize from not expropriating direct investment. We first consider *narrow symmetric prizes*. By narrow, we mean that an act of default or expropriation has no spillovers to other investment relationships, such that the prize for honoring both contracts is the sum of the prizes from honoring each. By symmetric, we mean that the prize from honoring debts matches the prize from honoring direct investments. Formally, $P^{DE} = P^D + P^E > 0$ and $P^D = P^E$. To facilitate comparison with our previous results, we let P^D and P^E each equal 35 percent of the benchmark level, $(1-\sigma)U^{FB}$, and allowed σ to range between 1/5 and 5.

With these assumptions, the combined model produces lower rates of sovereign theft and higher levels of international investment than a world with only one type of foreign investor. The combined model has these effects because it allows the government to raise an optimal mix of debt and FDI. For very low levels of σ, the optimal mix involves more debt than

equity. At $\sigma = 1/5$, for example, the country raises 58 percent of its capital from lenders and gets the balance from direct investors. As the country becomes more risk-averse, FDI rises to dominate debt. The relationship between σ and composition of the portfolio is not monotonic, though; the largest role for FDI occurs at around $\sigma = 4/3$, when direct investors supply 69 percent of the country's funds.

Although the contributions of debt and FDI in our simulations varied with σ, the sum of these two types of investment was nearly constant and almost exactly equal to the first-best level. Moreover, sovereign theft almost never occurred. By raising two types of capital, loans and direct investments, the country kept the amount of each small enough that theft was not a tempting option. In equilibrium, only the most risk-averse leaders (those with $\sigma > 4$) ever defaulted and/or expropriated, and they did so no more than 4 percent of the time.

These findings suggest lessons about the structure of international capital markets. If the prize for honoring debt contracts is equal in magnitude to, but also independent from, the prize for respecting direct investments, then all parties are better off in a world with both debt and FDI than in a world that offers only one type of investment. Laws that limit either type of investment will, therefore, reduce welfare by preventing the sovereign government from attracting the optimal level and mix of debt and equity.

For more insight about the model with narrow symmetric punishments, we next cut the prizes in half, such that P^D and P^E each stood at only 17.5 percent of the benchmark level. With smaller prizes, investor-government relations more closely resembled the patterns from the debt-only and equity-only models. Specifically, the probability of default increased

monotonically with σ, whereas the probability of expropriation declined as σ approached 1 and increased thereafter (see figures 3.4a and 3.4b). Moreover, at low levels of σ, the country raised relatively more capital from debt than from direct investment, whereas the opposite was true when σ exceeded 1. Overall, the total amount of capital never exceeded 70 percent of the first-best level (see Figure 4c).

[figures 3.4a–3.4d here]

Finally, we examined the possibility of *broad symmetric prizes*. By broad, we mean that any act of sovereign theft would undermine all the country's investment relationships. Spillovers could arise through retribution, in which lenders and direct investors coordinate their retaliatory strategies, or through reputation, in which a country that seizes some types of investments signals that it would seize other types, as well. Our concept of broad symmetric prizes implies that the reward from honoring both types of contracts exceeds the sum of rewards from honoring either in isolation—that is, $P^{DE} > P^D + P^E > 0$. In our simulations, we set $P^D = P^E = P^{DE}/6$, where P^{DE} was 35 percent of $(1-\sigma)U^{FB}$.

In such a world, defaults and expropriations almost always coincided. Figure 3.4d displays, for each level of σ, the productivity levels at which the country found it optimal to steal from foreign investors. At low levels of risk aversion, the country honored both types of contracts, no matter what state of the world it encountered. At about $\sigma = 1$, though, the country began responding to adverse productivity shocks by defaulting and expropriating simultaneously. The country occasionally expropriated at θ's that were too high to warrant default, but most of the time the two acts of sovereign theft were perfectly coordinated. We

return to the theme of narrow versus broad prizes later in the chapter, when we use a new data set to test whether defaults and expropriations have coincided in practice.

3.4 THE OPTIMAL SELF-ENFORCING CONTRACT

In this section we retain the assumption that the country cannot commit to honoring contracts, but we remove all restrictions on the types of contracts that can be issued. Rather than specifying all possible contracts, we find the optimal "self-enforcing" contract—the best possible contract that the country has an incentive to respect.

3.4.1 The Model

The optimal contract specifies the investment level k, the country's state-contingent consumption $c(\theta)$, and payments $t(\theta)$ that the country will make to foreign investors. Assuming that, due to competition, investors earn no profits, the best contract maximizes the country's expected welfare $E[U(c(\theta))]$, subject to three types of constraints: a sequence of feasibility constraints

$$c(\theta) + t(\theta) \leq \theta f(k)$$

for all θ, which imply that the output retained by the country, plus the output transferred to foreign investors, cannot be larger than the total production; a single zero-profit constraint for foreign investors,

$$E[t(\theta)] = (1 + r^w) k;$$

and a sequence of "no sovereign theft" constraints

$$U\left(c\left(\theta\right)\right)+P^{DE}\geq U\left(\theta f\left(k\right)\right)$$

for all θ, which require that the country receive enough consumption to deter it from engaging in sovereign theft in all states of the world.

If we define $\pi\left(\theta\right)\mu\left(\theta\right)$ to be the Lagrange multipliers on the feasibility constraints, λ to be the multiplier on the zero-profit constraint, and $\pi\left(\theta\right)\gamma\left(\theta\right)$ to be the multipliers on the "no sovereign theft" constraints, then the first-order necessary conditions[4] for an optimum include

$$\begin{aligned}\left(1+\gamma\left(\theta\right)\right)U'\left(c\left(\theta\right)\right) &= \mu\left(\theta\right),\\ \mu\left(\theta\right) &= \lambda,\\ \lambda\left(1+r^{w}\right) &= f'\left(k\right)E\left[\theta\mu\left(\theta\right)-\theta\gamma\left(\theta\right)U'\left(\theta f\left(k\right)\right)\right].\end{aligned}$$

3.4.2 Analytical Results

What do these first-order conditions imply about the behavior of sovereign governments and foreign investors? If the "no sovereign theft" constraints do not bind in any state of the world—that is, $\gamma\left(\theta\right)=0$ for all θ—then

$$U'\left(c\left(\theta\right)\right)=\lambda$$

for all θ, and the consumption of the country is perfectly smoothed. In addition, investment is at the first-best level

$$1 + r^w = f'(k) E[\theta].$$

In any state where the "no sovereign theft" constraint binds, we have

$$U'(c(\theta)) = \frac{\lambda}{1 + \gamma(\theta)} < \lambda.$$

This shows that the optimal contract deters default or expropriation by awarding the country more consumption (and hence a lower marginal utility of consumption) when the "no sovereign theft" constraint binds than when it does not. From this, a simple variational argument shows that these constraints bind only in high-θ states of the world. Intuitively, the country would like to smooth its consumption completely and only fails to do so in states of the world where the constraint on repayment binds. But this constraint is tighter in states of the world where production is higher (high θ). This suggests that equity should improve on debt in the contractual structures considered above, at least when agents are not too risk averse.

To see how the optimal self-enforcing contract relates to agreements observed in practice, it is instructive to consider the logarithmic utility case. As we argued above, the optimal contract specifies a fixed amount of consumption for the country in bad times (when the "no sovereign theft" constraint does not bind), and allows consumption to rise with the level of production in good times (when the constraint binds). In good times, then, the

amount of consumption is determined by

$$U\left(c\left(\theta\right)\right) = U\left(\theta f\left(k\right)\right) - P^{DE},$$

which, for logarithmic preferences, can be rearranged to get

$$c\left(\theta\right) = e^{-P^{DE}}\theta f\left(k\right).$$

This shows that, in good times, the country receives a fixed share $e^{-P^{DE}}$ of output, as in some royalty contracts. The share it receives in good times is decreasing in the size of the prize for honoring contracts, whereas the amount it receives in bad times increases in the size of this prize. Intuitively, a bigger prize deters sovereign theft, so the country is insured against fluctuations in output to a greater degree.

Although in equilibrium the country honors the optimal self-enforcing contract in all states of the world, the mere option of sovereign theft (the inability to commit to honoring contracts) affects the amount of capital that investors are willing to supply. Rearranging the first-order condition in k yields

$$1 + r^{w} = f'\left(k\right) E\left[\theta - \frac{\theta\gamma\left(\theta\right)}{\lambda} U'\left(\theta f\left(k\right)\right)\right].$$

The term within the expectation operator is less than θ in high-θ states of the world. This decreases the expected return and means that investment will be below the first-best level when the country cannot commit to honoring its contracts.

3.4.3 Numerical Results

To say more about the features of the optimal self-enforcing contract, we solve the model numerically. Substituting for $t(\theta)$ from the feasibility constraints and rearranging, the problem involves choosing k and $c(\theta)$ to maximize $E[U(c(\theta))]$, subject to the single zero-profit constraint for investors,

$$(1 + r^w) k = E[\theta f(k) - c(\theta)],$$

and a sequence of "no sovereign theft" constraints

$$c(\theta) \geq U^{-1}\left(U(\theta f(k)) - P^{DE}\right)$$

for all θ.

The following two-stage algorithm solves the model:[5]

Algorithm 4 *(Optimal Self-Enforcing Contract Model)*

1. *For every level of capital k, find the optimal sequence of state-contingent consumption levels $c(\theta)$ subject to the constraint that investors make no profits and that the country would willingly honor the contract. This solution implies a sequence of state-contingent transfers to investors, $t(\theta)$.*

2. *From the results from step 1, choose the level of k that maximizes the expected value to the country.*

Figures 3.5a and 3.5b compare the optimal self-enforcing contract with the equilibrium contracts from the other models. The figures show the proportion of output that the country retains for itself in each model, under the assumption that $\sigma = 2$ (figure 3.5a) or $\sigma = 1/2$ (figure 3.5b).[6]

[figures 3.5a–3.5b here]

In the debt-only model, the country's share of output follows a Z-shaped pattern. When output is low, the country defaults and thus keeps 100 percent of the resources. As output rises, though, the prize for maintaining good relations with lenders eventually overwhelms the temptation to default. At that point the country transfers a proportion $b/\theta f(k)$ of output to lenders and retains the complementary proportion $1 - b/\theta f(k)$ for itself. With b fixed, any further increases in output go directly to the country, thereby raising its share of the total. The FDI-only model produces a similar Z-shaped pattern. With $\sigma = 2$, the country expropriates out of desperation and thus seizes all the output in bad times. Once output reaches a sufficiently high level, though, the country starts remitting the proportion α of direct investors and retaining the balance at home. With $\sigma = 1/2$ and other parameters at our benchmark levels, the country never expropriates. Consequently, the country's share of output is constant and equal to $1 - \alpha$.

The combined model, which includes both debt and equity, blends features from each type of investment. When prizes are narrow and $\sigma = 2$, the country violates both types of contracts when output is low, violates only debt contracts at intermediate output levels, and respects both types of contracts at high output levels. When prizes are broad, the pattern is

similar, except the country either violates or honors both contracts simultaneously. When $\sigma = 1/2$, neither default nor expropriation occurs in equilibrium. The country's royalties therefore increases with output, at a rate proportional to the share of debt in the country's portfolio of liabilities.

Thus, in a world of debt contracts, equity contracts, or a mix of the two, the relationship between output and the country's share is either flat or increasing everywhere, except in the region of sovereign theft. This demonstrates the role of sovereign theft in providing partial (and costly) insurance against bad economic outcomes.

The optimal self-enforcing contract is fundamentally different. In bad times, the country's consumption under the optimal contract is constant, and hence declines as a function of output. In better times the country's consumption rises with output at a rate that depends on the value of σ. In the relatively risk-averse case of $\sigma = 2$, consumption during good times rises more slowly than output, and hence the royalty curve continues to slope downward. Risk sharing is, therefore, more extensive with the optimal self-enforcing contract than with debt and/or equity. In the more risk-tolerant case of $\sigma = 1/2$, consumption during good times accelerates faster than output, causing the royalty curve to turn upward. The curve most closely resembles a debt contract, which helps explain why debt outperforms equity at low levels of risk aversion. The shape of the curve also helps explain why, when σ is low, expropriation tends to occur in good states, because this is the only way for FDI to produce patterns of payments that approximate the optimal self-enforcing contract.

3.5 SOVEREIGN THEFT AND FOREIGN INVESTMENT IN HISTORY

We now document historical patterns of sovereign theft and foreign investment, in order to shed new light on theoretical debates about these phenomena. Our analysis proceeds in three steps. We construct a new data set about sovereign theft since the late 1920s, use the data to identify key patterns of default and expropriation, and finally study how the level and composition of foreign investment have varied over time.

3.5.1 Measures of Sovereign Theft

To determine which countries owed debts to foreign bondholders and commercial banks, we employed the methods in Tomz and Wright 2007. For each year from 1929 and 1970, we classified a country as indebted if it, according to Adler 2005, had outstanding obligations to foreign bondholders. For the years from 1970 to the present, we counted a country as indebted if the World Bank (2007) listed it as owing money to foreign private creditors, excluding trade creditors.

Having determined which countries owed debts, we next documented cases in which defaults took place. A default occurred whenever a county failed to pay interest or repay principal within the allowable grace period. We also regarded a country as having defaulted if, in the case of sovereign bonds, it made an exchange offer that contained terms "less favorable than the original issue," or if, in the case of bank credits, the parties rescheduled the principal and/or interest at "less favorable terms than the original loan" (Beers and Chambers 2004). In our data set, a default started when the government first missed a

payment or rescheduled a loan, and it ended when most creditors agreed to settle with the country.[7]

Our measure of default, like our measure of indebtedness, focuses entirely on transactions with private creditors. It therefore differs from Paris Club reschedulings and other defaults involving public-sector lenders. Moreover, to keep the focus on *sovereign* theft, we document defaults of national governments while omitting defaults by cities or provinces. Data on defaults are from Beers and Chambers 2004 and Suter 1990.

We used similar methods to document the potential for and the occurrence of expropriation. A country was regarded as having expropriable FDI in a particular year if, in that year, U.S. citizens held direct investments in the country. We obtained data on FDI positions from 1929 to the present through a comprehensive search of reports by the U.S. Commerce Department and the U.S. Bureau of Economic Analysis. The resulting country-year panel of FDI positions is, to our knowledge, the most extensive in existence. Nonetheless, it omits countries that received direct investments entirely from non-U.S. sources. Future research could expand the coverage to include other suppliers of direct investment.

Following Kobrin 1980 and 1984, we adopted a broad definition of expropriation that embraces any of the following actions: (1) nationalization, defined as action by a government to take ownership of a foreign firm; (2) coerced sale, in which the government threatens or takes actions that induce foreigners to sell part or all of their direct investments to the government or to domestic citizens; (3) intervention or requisition, in which the government takes control of foreign direct investments without proclaiming itself the rightful owner; or (4) renegotiation, in which the government compels direct investors to accept substantial

changes in a contract or a concession. We regard these acts as expropriation, regardless of whether the government offers compensation to affected investors.

Our inventory of expropriations covers much of the twentieth century. We gathered data for the years 1929–1960 by combing through a wide range of primary and secondary sources.[8] We then augmented our newly collected data with existing inventories by Kobrin (1984) for the period 1960–1979, Minor (1994) for the years 1980–1992, and Hajzler (2007) for the years 1993–2004. The resulting database, although still preliminary, provides a unique long-run perspective on sovereign theft.

3.5.2 Patterns of Sovereign Theft

Figure 3.6 displays trends in sovereign theft over nearly a century. Figure 3.6a shows, for each year from 1929 to 2004, the number of sovereign countries in the world that expropriated at least some foreign direct investment or initiated default on at least one loan from private foreign lenders. Figure 3.6b reexpresses the same data as a share of all countries with the potential for sovereign theft.

[figures 3.6a–3.6b here]

Two patterns emerge immediately. First, sovereign theft has occurred in waves. In some historical periods, many countries have taken property that belonged to foreign investors, but in other periods, countries generally have refrained from defaulting and/or expropriating. Second, waves of default and expropriation have not coincided. Defaults were most common during the Great Depression of the 1930s and during the economic crises that

struck developing countries in the 1980s. Expropriations, in contrast, were most prevalent during the 1970s, with smaller surges in the 1960s and at the end of the sample period.

These alternating waves of default and expropriation have interesting implications for theories of sovereign theft. As noted earlier, some authors argue that sovereign theft has spillover effects: by cheating one type of investor, a country spoils its relations with other types of investors. Spillovers could arise through a process of retribution, in which lenders and direct investors coordinate their retaliatory strategies. Spillovers could also arise via a reputational mechanism in which, for example, default would signal that a government is a "bad type" that would also expropriate direct investments. With spillover effects or "broad prizes," expropriations and defaults should cluster together in time.[9] The global oscillation between the default and expropriation seems at odds with the spillover hypothesis.

Although defaults and expropriations have not coincided in the aggregate, there is an interesting country-level relationship between these two types of sovereign theft (see table 1). The countries in the upper-left quadrant of the table neither defaulted nor expropriated at any point in the years 1929–2004, whereas the countries in the lower-right quadrant both defaulted and expropriated, although usually not simultaneously. Overall, nearly 70 percent of countries occupy one of those two quadrants, versus only 30 percent that expropriated without ever defaulting or defaulted without ever expropriating. The chi-squared statistic for table 3.1 is 28 with 1 degree of freedom. In a sample of this size, the probability of observing such a strong relationship between default and expropriation purely by chance is less than 1 in 1,000.

[table 3.1 here]

It seems, therefore, that most countries fall into one of two categories: they consistently refrain from default and expropriation, or they willingly practice both types of sovereign theft. Future research should examine the factors that distinguish no-theft from pro-theft countries, and that explain why some countries practice one form of sovereign theft but not the other.

Setting aside the correlation between default and expropriation, it is both theoretically and practically important to ask whether sovereign theft occurs more often in good times or in bad. A detailed analysis of this question must await future research, but figure 3.6 suggests some lessons. The largest waves of default occurred during the Great Depresssion and the 1980s, periods of severe economic hardship for developing countries. There were far fewer defaults during periods of relative economic growth. This pattern is consistent with the hypothesis that countries default more often in bad times than in good, although Tomz and Wright (2007) show that the relationship between economic performance and default is weaker than previous scholars had assumed.

In theory, the relationship between economic conditions and expropriation should depend on the risk aversion of political leaders. Those who feel relatively neutral about risk will expropriate opportunistically during good times, whereas those who are highly risk averse will expropriate out of desperation during hard times. Figure 3.6 shows a massive surge in expropriations during the 1970s, a period often classified as a boom for developing countries (especially those that were exporting commodities). Expropriations began before

commodity prices began to soar, however. There is, therefore, some evidence that leaders expropriate opportunistically, but the correlation is not perfect.

The patterns of sovereign theft that we have uncovered can be rationalized within our suite of models under two auxiliary assumptions. If prizes are narrow, one can rationalize asynchronous defaults and expropriations. And if leaders are relatively neutral to risk, one can rationalize an apparent tendency to default in bad times but to expropriate in good times.

3.5.3 Patterns of Foreign Investment

Our models have implications not only for sovereign theft, but also for the level and composition of foreign investment. No detailed data exist on the global stock of debt versus direct investment over the past century. One can, however, gain insight from the work of Lane and Milesi-Ferretti (2007), who calculate net foreign asset and liability positions beginning in 1973, and break them down into debt, foreign direct investment, and portfolio investment. They partition the data into two country groupings: the "developed countries," defined as the 1973 membership in the Organization for Economic Cooperation and Development (OECD), and all other countries, which are classified as "developing."

Figure 3.7 decomposes the major classes of gross foreign liabilities of developed countries (figure 3.7a) and developing countries (figure 3.7b). For both groups of countries, debt is on average at least as important as FDI, which is consistent with our theory provided that leaders are relatively risk tolerant. Interestingly, though, the proportion of foreign liabilities

due to debt is "hill-shaped": rising at the start of the period, reaching a peak in the mid-1980s, and falling in recent years. This hill-shaped pattern could reflect changes in the values of P^D and P^E, the prizes for honoring debt and equity contracts, respectively. Our model predicts a positive association between the ratio P^D/P^E and the share of debt in countries' foreign liabilities. If P^D/P^E rose through the early 1980s but retreated thereafter, one would expect debt to rise and fall in importance, as shown in Figure 3.7.

[figures 3.7a–3.7b here]

We next consider patterns of total liabilities, scaled by gross domestic products. As figures 3.8a–3.8d reveal, both measures of liabilities have trended upward, with developed countries showing the fastest growth in gross liabilities and developing countries experiencing the fastest growth in net liabilities. These figures also expose a danger associated with the use of international investment position statistics. By the end of the period, both the developing and developed countries were net debtors, implying (illogically) that the world was in net debt to someone else. Although one must, therefore, be cautious in interpreting the data, the rising pattern of liabilities is stark, and is probably robust to corrections in the measurement of net positions. Such growth in both gross and net foreign investment positions could arise, for example, if the overall level of prizes increased over time.

[figures 3.8a–3.8d here]

As noted earlier, though, sovereign theft has occurred in alternating waves, with expropriations in the 1970s and defaults in the 1980s. We would expect such behavior if, for instance, P^E fell at the beginning of the sample period and P^D fell subsequently.

In summary, we observe a hill-shaped pattern in the level of debt, an overall increase in liability positions, and oscillation between expropriation and default. Reconciling these facts is a delicate exercise. Perhaps the prizes for repaying debt and honoring equity have moved in opposite directions, with rises in P^D outstripping declines in P^E prior to the 1980s, and with rises in P^E more than compensating for reductions in P^D from the 1980s to the present. Future research should investigate, in more detail, how the prizes for honoring debt and equity have evolved over time.

3.6 CONCLUSION

Foreign investments in both debt and equity are subject to the risk that the foreign government may, directly or indirectly, interfere with their repayment. Despite this similarity, and despite substantial literatures devoted to examining the phenomena of sovereign default and expropriation of direct investments separately, little has been done to compare and contrast the two. In this chapter, we have made a first attempt at examining the interrelationship between default on debt and the expropriation of direct investment—what we have referred to as sovereign theft—in both theory and practice.

Our models show that, at least in theory, the incentives for sovereign theft and patterns of foreign investment depend crucially on the state of the economy, the risk aversion of political leaders, and the nature of punishments for default and expropriation. Defaults are more likely in bad times than in good. Expropriations, on the other hand, will arise out of desperation in bad times if leaders are risk averse, but will occur out of opportunism in

good times if leaders are relatively risk tolerant. Naturally, cooperation between investors and sovereign governments will improve with the prizes for honoring contracts. Nonetheless, much depends on whether prizes are broad or narrow. If prizes are broad, such that a single act of sovereign theft spills over to affect all of a country's investment relations, countries should default and expropriate simultaneously, instead of honoring one type of contract while violating the other.

Using a new data set about sovereign theft across much of the twentieth century, we found that defaults and expropriations have been remarkably asynchronous. One possible explanation is that prizes are, in fact, relatively narrow: seizing from one type of foreign investor does not spoil relations with other types of investors. A different explanation focuses on shifts in the composition of the foreign liabilities in developing economies, first away from direct investment toward debt, and more recently back to direct investment and portfolio equity. In the 1970s, when direct investment was a greater proportion of foreign liabilities, expropriations reached their historical peak. In the decade that followed, foreign investments were increasingly channeled into sovereign lending, which culminated in the debt crisis of the 1980s. Perhaps partly in response to this crisis, direct investment and portfolio equity have reemerged as an important source of foreign liabilities for developing economies.

Our theories have abstracted from many issues that affect the level of direct investment and the incentives to expropriate. One is the fact that countries use different sources of capital—loans versus FDI—to fund different types of projects. If the risk properties of these investments differ, our models would make different predictions about the likelihood

of observing defaults and expropriations at different points in the economic cycle.

Another issue that we have mostly abstracted from is that direct investment typically brings with it some control over the project's operations[10]. In future analyses, therefore, one could relax the assumption of symmetry and allow the direct penalties associated with expropriation to exceed those associated with debt default. Control may be important in other respects, as well. It may, for instance, be an additional motive for expropriation, particularly when the control extends to assets with special national or strategic significance.

The issue of control is also related to deeper questions about the design of financial contracts and the incentives they give to managers of firms. Much of the corporate finance literature has examined the incentive of firms to issue debt versus equity, and has emphasized the trade-off between agency costs and monitoring costs. These issues are no doubt important for thinking about FDI versus debt. To the best of our knowledge, no one has examined the effect of political risk on this trade-off. This should be a focus of future work.

Notes

[1]This argument has been made in various forms by many authors, including Eaton and Gersovitz (1981a, 1984), Thomas and Worrall (1994), and Albuquerque (2003).

[2]The magnitude of punishments may vary with the degree of sovereign theft. For example, Schnitzer (2002) argues that retribution is less likely when countries engage in "creeping expropriation" of FDI than when they engage in outright nationalization.

[3]In deriving the inequality, note that the factor $(1-\sigma)$ in the numerator and the factor $1-(1-\alpha)^{1-\sigma}$ in the denominator both change signs as σ crosses the threshold from being less than one to being greater than one.

[4]The problem is not convex because of the presence of concave U and f on the right-hand side of the "no sovereign theft" constraint. Hence, the first-order conditions are not, in general, sufficient to guarantee a solution.

[5]We break the solution into two stages to guarantee that the first stage is a well-behaved convex programming problem.

[6]We let P^{DE} equal 35 percent of $(1-\sigma)U^{FB}$ when $\sigma = 2$, and 100 percent of $(1-\sigma)U^{FB}$ when $\sigma = 1/2$. All other parameters were at our benchmark levels.

[7]A country is defined to be in default in a given year if it was in default for any month of that year, with the exception of defaults that are settled in January of a given year, which are assumed to imply that the country is not in default for that year.

[8]The following sources were especially useful for expropriations before 1960: Lipson 1985; Truitt 1974; U.S. Congress, House Committee on Foreign Affairs 1963; White 1961; and

Wilkins 1970.

[9]The two types of sovereign theft should also cluster in time if leaders are highly risk averse ($\sigma > 1$), because such leaders would find both default and expropriation attractive in periods of low economic productivity.

[10]The issue of control is at the heart of the decision to invest directly in a foreign firm, as opposed to licensing a technology to that firm, as discussed in Antras, Desai, and Foley 2009.

REFERENCES

Adler, Michael. 2005. *Sovereign Bond Database*. New York: Graduate School of Business, Columbia University.

Aguiar, Mark, and Gita Gopinath. 2006. "Defaultable Debt, Interest Rates and the Current Account." *Journal of International Economics* 69:1, 64–83.

Ahmed, Faisal, Laura Alfaro, and Noel Maurer. 2007. *Gunboats and Vultures: Market Reaction to the "Enforcement" of Sovereign Debt*. Working paper, Harvard University.

Albuquerque, Rui. 2003. "The Composition of International Capital Flows: Risk Sharing through Foreign Direct Investment." *Journal of International Economics* 61:2, 353–383.

Amador, Manuel. 2004. *A Political Economy Model of Sovereign Debt Repayment*. Working paper, Stanford University.

Antras, Pol, Mihir A. Desai, and C. Fritz Foley. 2009. "Multinational Firms, FDI Flows and Imperfect Capital Markets." *Quarterly Journal of Economics* 124:3, 1171–1219.

Arellano, Cristina. 2008. "Default Risk and Income Fluctuations in Emerging Economies." *American Economic Review* 98:3, 690–712.

Beers, David T., and John Chambers. 2004. "Sovereign Defaults: Set to Fall Again in 2005." *Standard and Poors*, September 28.

Benjamin, David, and Mark L. J. Wright. 2009. *Recovery before Redemption: A Model of Delays in Sovereign Debt Renegotiations*. Working paper, SUNY-Buffalo and UCLA.

Broner, Fernando, Alberto Martin, and Jaume Ventura. 2006. *Sovereign Risk and Secondary Markets*. Cambridge, MA: National Bureau of Economic Research Working Paper 12783.

Bulow, Jeremy, and Kenneth Rogoff. 1989a. "A Constant Recontracting Model of Sovereign Debt." *Journal of Political Economy* 97:1, 155–178.

Bulow, Jeremy, and Kenneth Rogoff. 1989b. "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review* 79:1, 43–50.

Cole, Harold Linh, James Dow, and William B. English. 1995. "Default, Settlement, and Signalling: Lending Resumption in a Reputational Model of Sovereign Debt." *International Economic Review* 36:2, 365–385.

Cole, Harold Linh, and William B. English. 1991. "Expropriation and Direct Investment." *Journal of International Economics* 30:3–4, 201–27.

Cole, Harold Linh, and William B. English. 1992a. "Direct Investment: A Doubtful Alternative to International Debt." *Federal Reserve Bank of Minneapolis Quarterly Review* 16:1, 12–22.

Cole, Harold Linh, and William B. English. 1992b. "Two-Sided Expropriation and International Equity Contracts." *Journal of International Economics* 33:1–2, 77–104.

Cole, Harold Linh,. and Patrick J. Kehoe. 1998. "Models of Sovereign Debt: Partial Versus General Reputations." *International Economic Review* 39:1, pp. 55–70.

Domínguez, Jorge I. 1982. "Business Nationalism: Latin American National Business Attitudes and Behavior toward Multinational Enterprises." In Jorge I. Domínguez, ed., *Economic Issues and Political Conflict: U.S.-Latin American Relations.* Boston: Butterworth Scientific.

Eaton, Jonathan, and Mark Gersovitz. 1981a. "Country Risk: Economic Aspects." In Richard J. Herring, ed., *Managing International Risk.* New York: Cambridge University Press.

Eaton, Jonathan, and Mark Gersovitz. 1981b. "Debt with Potential Repudiation: Theoretical and Empirical Analysis." *Review of Economic Studies* 48:2, 289–309.

Eaton, Jonathan, and Mark Gersovitz. 1984. "A Theory of Expropriation and Deviations

from Perfect Capital Mobility." *Economic Journal* 94:373, 16–40.

Fernández-Arias, Eduardo, and Ricardo Hausmann. 2001. "Capital Inflows and Crisis: Does the Mix Matter?" In Jorge Braga de Macedo and Enrique V. Iglesias, eds., *Foreign Direct Investment Versus Other Flows to Latin America*. Paris: Interamerican Development Bank and OECD.

Hajzler, Chris. 2007. *Expropriation of Foreign Direct Investments: Trends from 1993 to 2006.* Working paper, University of Western Ontario.

Hausmann, Ricardo and Eduardo Fernández-Arias. 2001. "Foreign Direct Investment: Good Cholesterol?" In *Foreign Direct Investment Versus Other Flows to Latin America*, eds. Jorge Braga de Macedo and Enrique V. Iglesias. Paris: Interamerican Development Bank and OECD.

Kaletsky, Anatole. 1985. *The Costs of Default.* New York: Priority Press.

Kletzer, Kenneth M., and Brian D. Wright. 2000. "Sovereign Debt as Intertemporal Barter." *American Economic Review* 90:3, 621–639.

Kobrin, Stephen J. 1980. "Foreign Enterprise and Forced Divestment in LDCs." *International Organization* 34:1, 65–88.

Kobrin, Stephen J. 1984. "Expropriation as an Attempt to Control Foreign Firms in LDCs: Trends from 1960 to 1979." *International Studies Quarterly* 28:3, 329–348.

Lane, Philip R. and Gian Maria Milesi-Ferretti. 2007. "The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004." *Journal of International Economics* 73:2, 223–250.

Lipson, Charles. 1985. *Standing Guard: Protecting Foreign Capital in the Nineteenth and Twentieth Centuries*. Berkeley: University of California Press.

Martinez, Jose Vicente, and Guido Sandleris. 2008. *Is it Punishment? Sovereign Defaults and the Decline in Trade*. Working paper 01/2008, Centro de Investigación en Finanzas, Universidad Torcuato Di Tella.

Minor, Michael S. 1994. "The Demise of Expropriation as an Instrument of LDC Policy, 1980–1992." *Journal of International Business Studies* 25:1, 177–188.

Mitchener, Kris James, and Marc D. Weidenmier. Forthcoming. "Supersanctions and Sovereign Debt Repayment." *Journal of International Money and Finance*.

Pitchford, Rohan and Mark L. J. Wright. 2007. *Restructuring the Sovereign Debt Restructuring Mechanism*. Working paper, UCLA.

Platt, Desmond Christopher Martin. 1968. *Finance, Trade, and Politics in British Foreign Policy, 1815–1914*. Oxford: Clarendon Press.

Rose, Andrew K. 2005. "One Reason Countries Pay their Debts: Renegotiation and International Trade." *Journal of Development Economics* 77:1, pp. 189–206.

Rose, Andrew K., and Mark M. Spiegel. 2009. "Non-Economic Engagement and International Exchange: The Case of Environmental Treaties." *Journal of Money, Credit, and Banking* 41:2–3, 337–63.

Sandleris, Guido. 2008. "Sovereign Defaults: Information, Investment and Credit." *Journal of International Economics* 76:2, 267–75.

Schnitzer, Monika. 2002. "Debt vs. Foreign Direct Investment: The Impact of Sovereign Risk on the Structure of International Capital Flows." *Economica* 69: 273, 41–67.

Spiegel, Mark M. 1994. "Sovereign Risk Exposure with Potential Liquidation: The Performance of Alternative Forms of External Finance." *Journal of International Money and Finance* 13:4, 400–414.

Suter, Christian. 1990. *Schuldenzyklen in der Dritten Welt: Kreditaufnahme, Zahlungskrisen und Schuldenregelungen peripherer Länder im Weltsystem von 1820 bis 1986*. Frankfurt a.M.: Anton Hain.

Thomas, Jonathan, and Tim Worrall. 1994. "Foreign Direct Investment and the Risk of Expropriation." *Review of Economic Studies* 61:1, 81–108.

Tomz, Michael. 2007. *Reputation and International Cooperation: Sovereign Debt across Three Centuries.* Princeton, N.J.: Princeton University Press.

Tomz, Michael, and Mark L. J. Wright. 2007. "Do Countries Default in 'Bad Times'?" *Journal of the European Economic Association* 5:2–3, 352–360.

Truitt, J. Frederick. 1974. *Expropriation of Private Foreign Investment*. Bloomington: Graduate School of Business, Division of Research, Indiana University.

U.S. Congress, House Committee on Foreign Affairs. 1963. *Expropriation of American-Owned Property by Foreign Governments in the Twentieth Century*. Washington, DC: U.S. Government Printing Office.

White, Gillian. 1961. *Nationalisation of Foreign Property*. London: Stevens and Sons.

Wilkins, Mira. 1970. *The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914*. Cambridge, MA: Harvard University Press.

World Bank. 2007. *Global Development Finance*. Washington, DC: World Bank.

Wright, Mark L. J. 2001. *Reputations and Sovereign Debt*. Working paper, Stanford University.

Yue, Vivian Z. 2006. *Sovereign Default and Debt Renegotiation*. Working paper, New York University.

Table 3.1: Sovereign theft by country, 1929–2004

	No Expropriation	Expropriation
No Default	Armenia, Australia, Azerbaijan, Bangladesh, Barbados, Belarus, Belgium, Belize, Botswana, Burundi, Canada, Cyprus, Czech Republic, Denmark, Djibouti, Estonia, Fiji, Finland, France, Georgia, Germany (reunified), Grenada, Hong Kong, Iceland, Ireland, Israel, Korea (South), Kyrgyzstan, Latvia, Lithuania, Luxembourg, Mali, Mauritius, Netherlands, New Zealand, Norway, Papua New Guinea, Portugal, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Singapore, Slovakia, Solomon Islands, Spain, Sweden, Switzerland, Tunisia, United Kingdom, Uzbekistan, Vanuatu	Benin, Chad, India, Kazakhstan, Lebanon, Lesotho, Malaysia, Nepal, Oman, Somalia, Sri Lanka, Swaziland, Syria, Thailand
Default	Albania, Austria, Bosnia, Bulgaria, Burkina Faso, China, Croatia, Czechoslovakia, Dominica, Germany (pre-war), Germany (West), Greece, Guinea Bissau, Italy, Jordan, Korea (North), Macedonia, Moldova, Nauru, Nigeria, Paraguay, Poland, Romania, Russia, Serbia, Seychelles, Slovenia, South Africa, Turkey, USSR, Ukraine, Uruguay, Vietnam, Yemen (North), Yemen (Unified)	Algeria, Angola, Antigua and Barbuda, Argentina, Bolivia, Brazil, Cameroon, Central African Republic, Chile, Colombia, Congo (Brazzaville), Congo (Kinshasa), Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Gambia, Ghana, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, Indonesia, Iran, Iraq, Ivory Coast, Jamaica, Japan, Kenya, Liberia, Madagascar, Malawi, Mauritania, Mexico, Morocco, Mozambique, Myanmar, Nicaragua, Niger, Pakistan, Panama, Peru, Philippines, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Trinidad and Tobago, Uganda, Venezuela, Yugoslavia, Zambia, Zimbabwe

Figure 3.1: A model of defaultable debt and expropriable direct investment

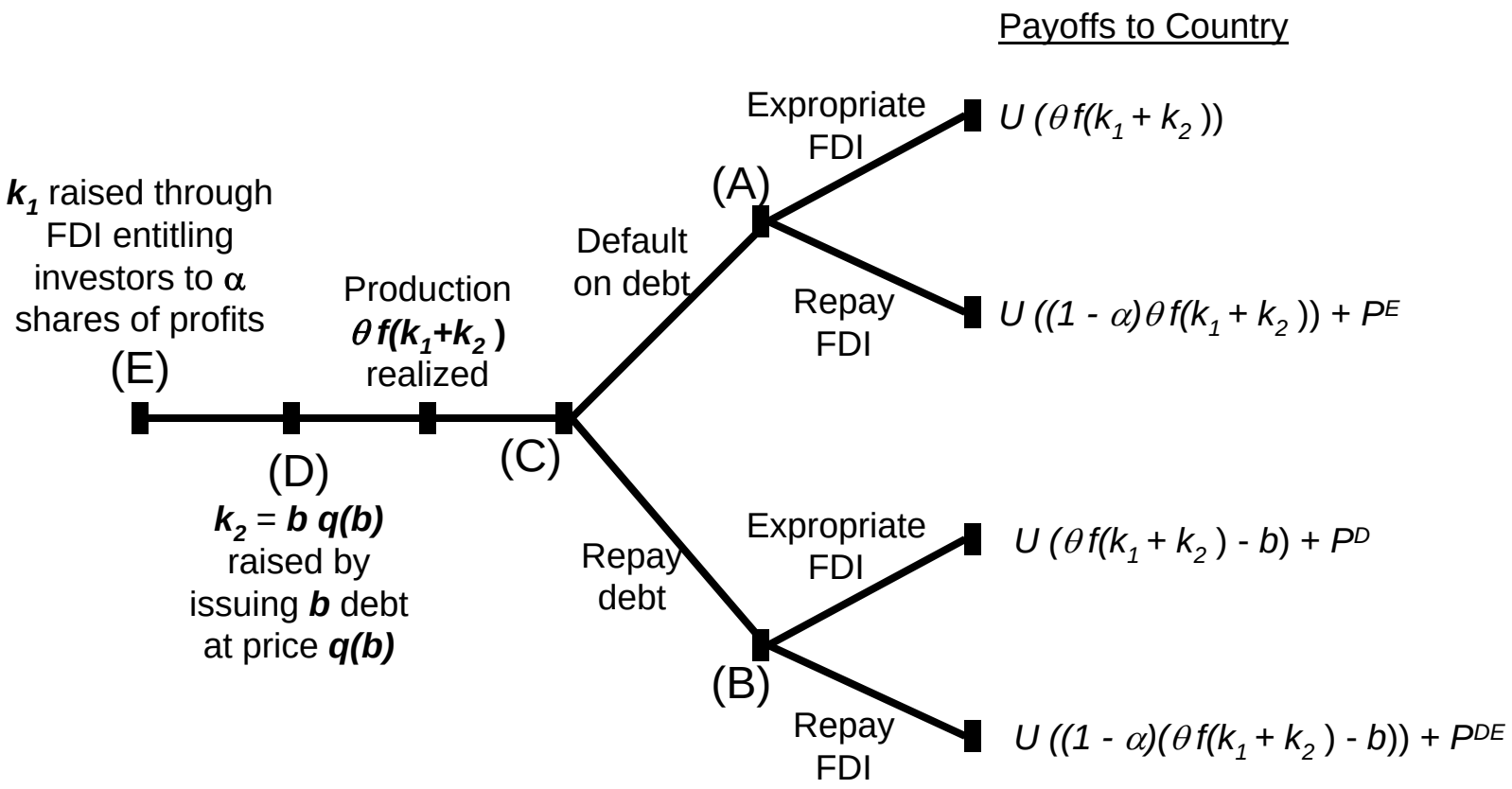
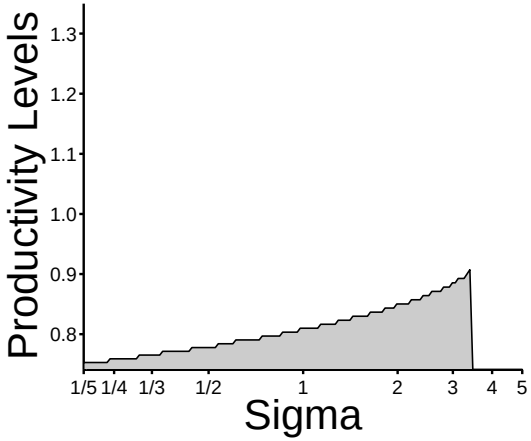
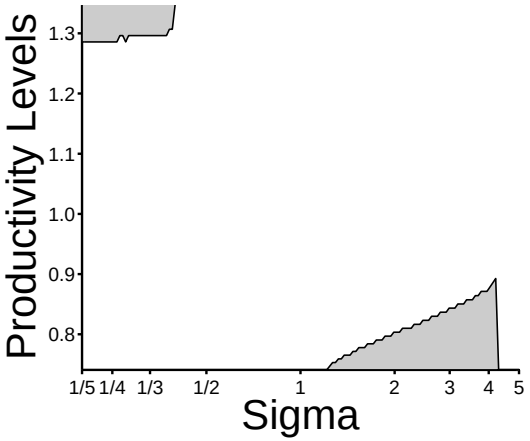


Figure 3.2: The effect of risk aversion (debt-only model vs. FDI-only model)

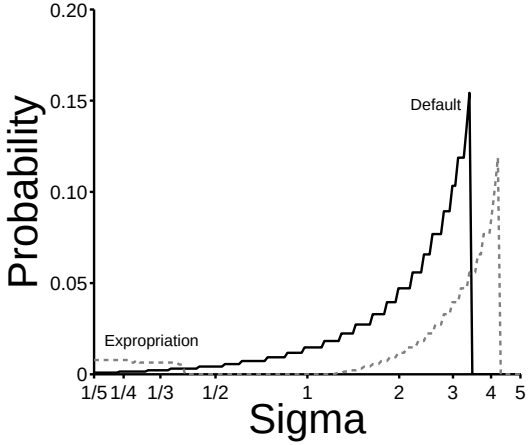
(a) Set of default states as a function of sigma



(b) Set of expropriation states as a function of sigma



(c) Probability of sovereign theft as a function of sigma



(d) Investment levels as a function of sigma

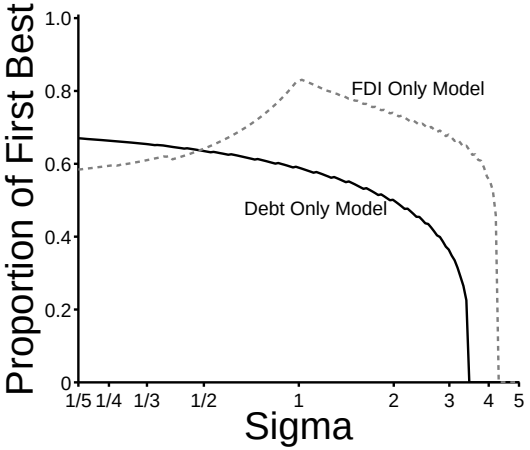
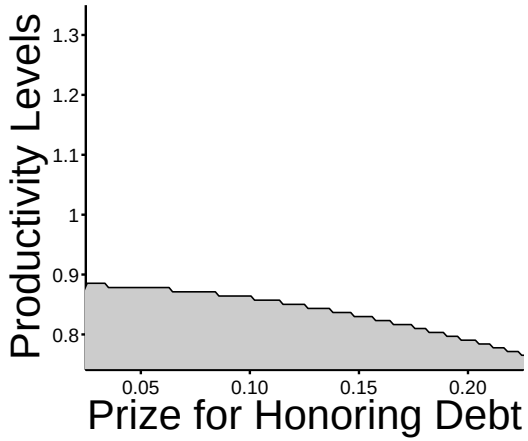
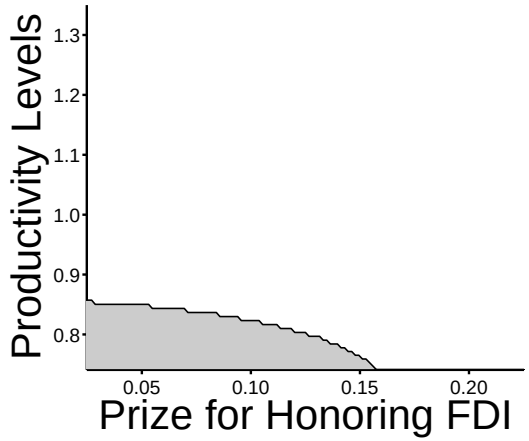


Figure 3.3: The effect of the prize for honoring contracts (debt-only model vs. FDI-only model)

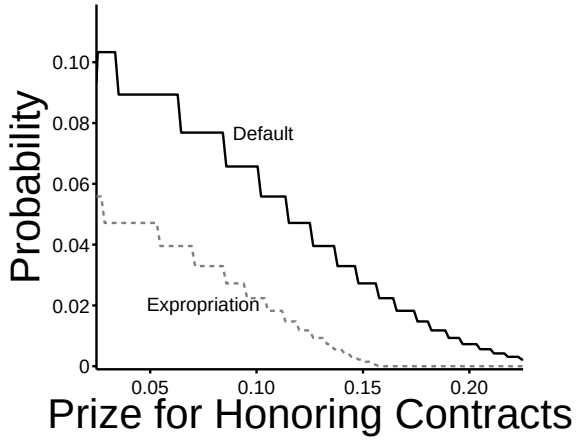
(a) Set of default states as a function of the prize



(b) Set of expropriation states as a function of the prize



(c) Probability of sovereign theft as a function of the prize



(d) Investment levels as a function of the prize

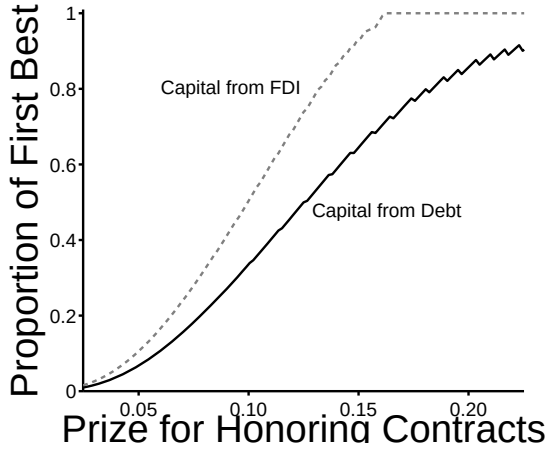
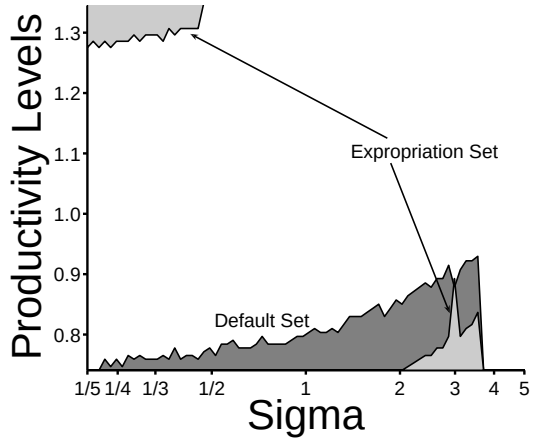
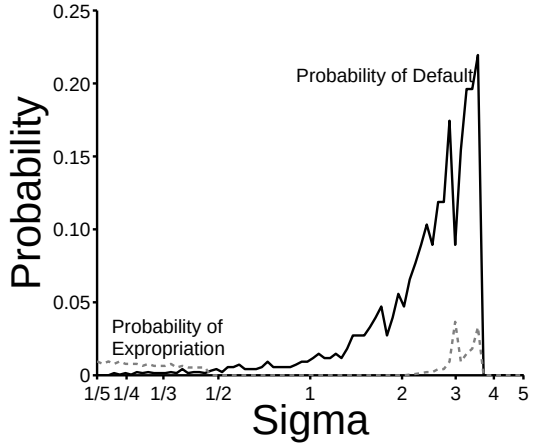


Figure 3.4: The effect of risk aversion (combined model: debt and FDI)

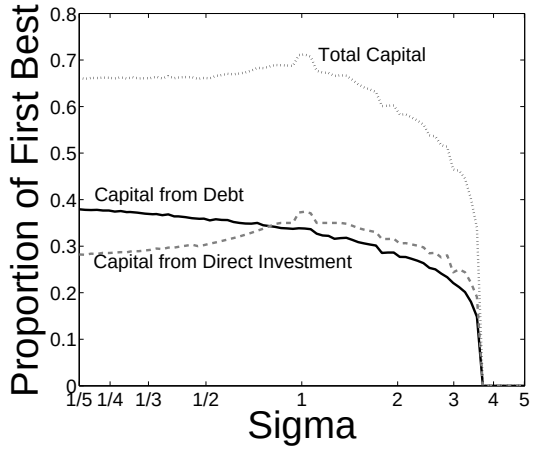
(a) Set of theft states when prizes are narrow and symmetric



(b) Probability of theft when prizes are narrow and symmetric



(c) Investment levels when prizes are narrow and symmetric



(d) Set of theft states when prizes are broad and symmetric

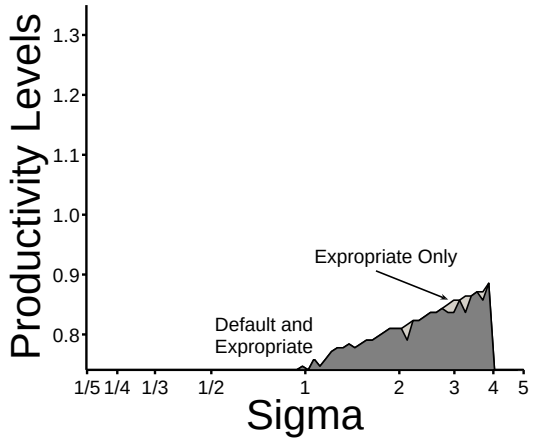
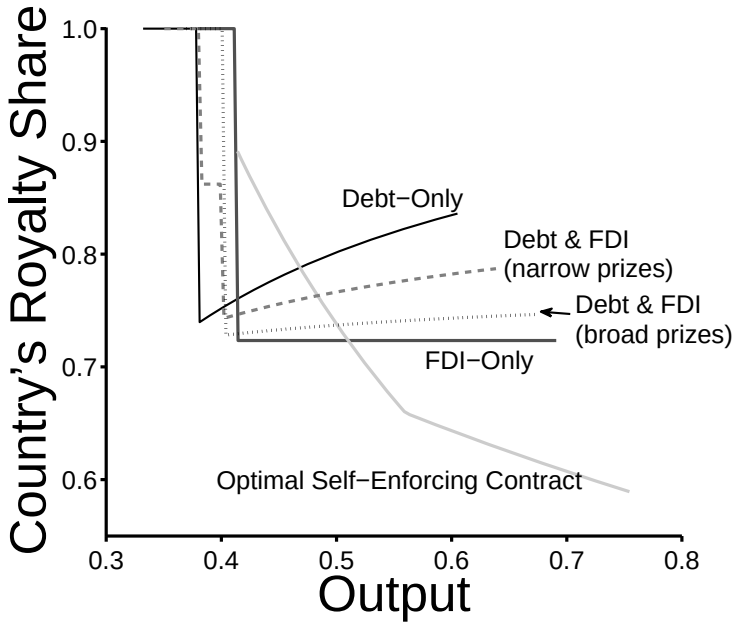


Figure 3.5: Country's royalties, by model

(a) Sigma = 2



(b) Sigma = 1/2

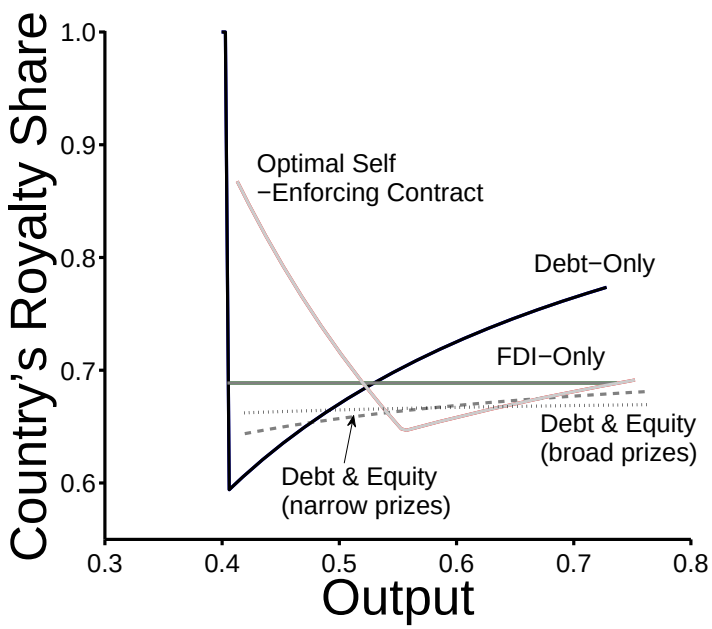
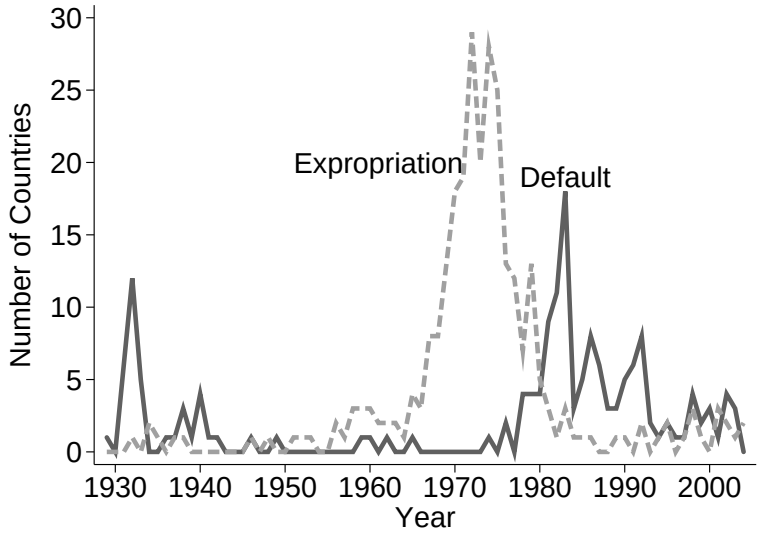


Figure 3.6: Sovereign theft in history

(a) Number of countries per year



(b) Proportion of countries per year

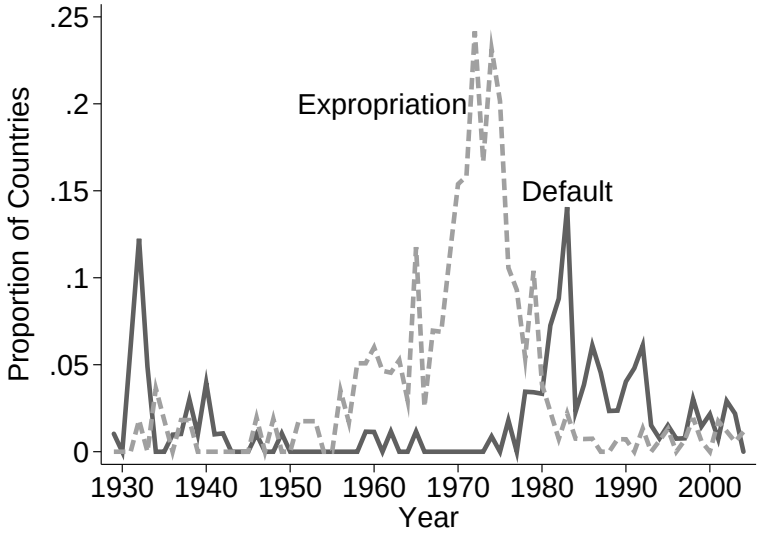
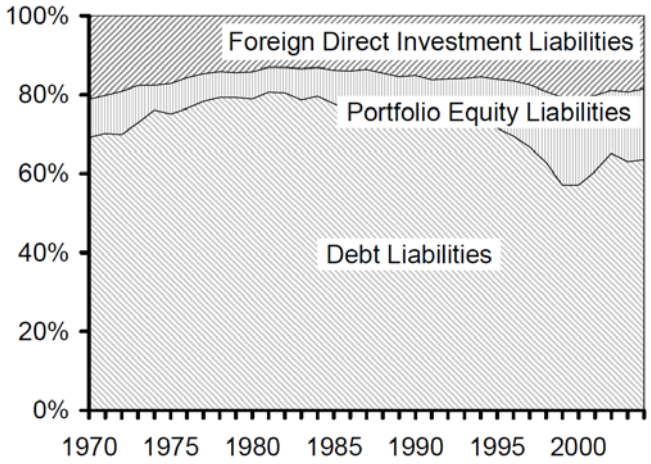


Figure 3.7: Gross liabilities by asset class

(a) Developed countries



(b) Developing countries

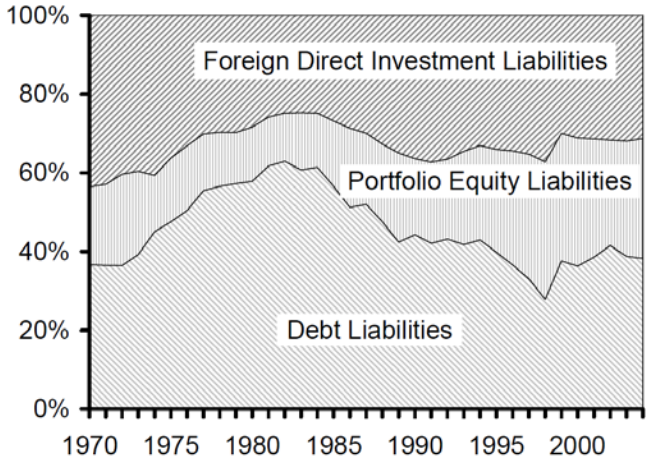
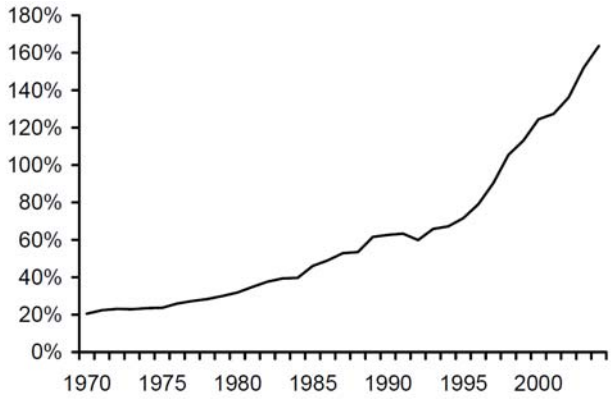
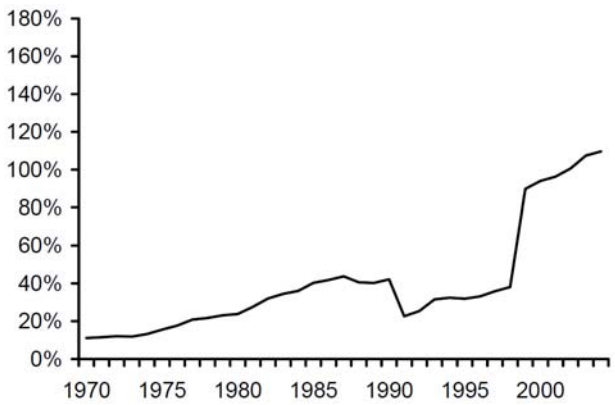


Figure 3.8: Gross and net liabilities as a percent of GDP

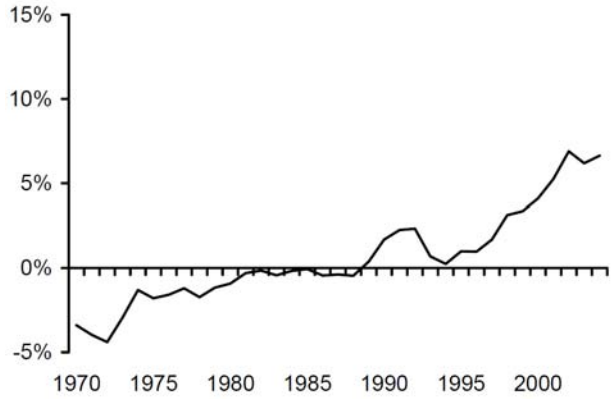
(a) Gross liabilities of developed countries



(b) Gross liabilities of developing countries



(c) Net liabilities of developed countries



(d) Net liabilities of developing countries