

State Ownership and Project Financing

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Barclay E. James
Associate Professor of International Business
Department of Management and Marketing
Greehey School of Business
One Camino Santa Maria
San Antonio, TX 78228
USA
Tel (210) 431-2030
Email bjames7@stmarytx.edu

&

Paul M. Vaaler
Professor
John and Bruce Mooty Chair in Law & Business
Department of Strategic Management and Entrepreneurship
Carlson School of Management

&

Law School
University of Minnesota
3-424 CarlSMgmt
321 19th Avenue South
Minneapolis, MN 55455
USA
Tel (612) 625-4951
Fax (612) 626-1316
Email vaal0001@umn.edu

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Abstract

Research in management and related fields offers different answers to questions about how partial state ownership in large infrastructure projects (projects) affects overall investment risk. In this chapter, we review those answers and their underlying theoretical assumptions. We then offer our own answer hinging on two factors: the extent of state ownership in a project and the institutional stability of state policies where that project is announced, financed, constructed, and operated. Our answer proposes that state ownership generally increases investment risk unless there is low state policy stability in the host country where the project is located. Then, substantial but non-controlling minority state ownership provides a second-best assurance against detrimental policy changes and decreases investment risk. We document empirical support for our proposition through analyses of state ownership and investment risk in 1190 projects announced but awaiting financing in 91 countries from 1990-2007. Regression and related empirical analyses indicate that minority state ownership reduces the likelihood that financing will be significantly delayed for projects located in host countries with low policy stability. Partial state ownership signals assurance against detrimental policy changes, but also possible interference under existing policies. Our study demonstrates the limited circumstances when the assurance signal dominates and partial state ownership acts as a helping rather than hindering hand to private investors and the projects they fund and govern.

Keywords: state ownership, policy stability, infrastructure projects, investment risk, signaling theory, financing speed

Author Biographies



Barclay E. James is Associate Professor of International Business at St. Mary's University's Greehey School of Business where he has been a faculty member since 2018. Prior to that he was on faculties at Universidad San Francisco de Quito and Louisiana State University. He writes and teaches on how multinational corporations (MNCs) manage political risk in developing countries. He has a special interest in MNC political risk management for project finance-based investments. More information on Professor James is available here: <https://www.stmarytx.edu/academics/faculty/barclay-james/>.



Paul M. Vaaler is Professor and John and Bruce Mooty Chair in Law & Business at the University of Minnesota's Law School and Carlson School of Management where he has been a faculty member since 2007. Prior to that he was on faculties at the University of Illinois at Urbana-Champaign and Tufts University. He writes and teaches on how foreign investing firms and individuals manage risks in developing countries undergoing policy reforms. More information on Professor Vaaler is available here: <https://carlsonschool.umn.edu/faculty/paul-vaaler>.

1. Introduction

In this book chapter, we take up important issues regarding state versus private ownership of large infrastructure investment projects (projects) intended not only to make money for investors but also to spur broader economic development. From 1990-2020, cumulative invested capital globally in power, water, telecommunications, transportation, energy, mining, and agribusiness projects exceeded US\$2 trillion. That number alone compels our research attention about how projects are owned and operated (James & Vaaler, 2018). They also draw our attention for their important indirect effects on the broader economy. Projects often act like platform technologies (Helpman, 1992) enhancing the productivity of surrounding businesses and communities drawing on their outputs.

Projects also draw the attention of states that host them, regulate them, and sometimes own them partially or wholly. International business (IB) researchers from Vernon (1971), to Robinson (1973), Kobrin (1979), Henisz (2000), Vaaler (2008), and others (*e.g.*, Inoue, Lazzarini, & Musacchio, 2013) have asked how often divergent interests of profit-seeking private investors and welfare-seeking politicians affect foreign project management decision-making, operation, and performance, particularly in developing countries. When adroitly owned and operated, projects make money for private investors and contribute to economic development goals important to politicians. When not, projects can be “captured” by states and used by politicians doling out jobs and money to party faithful. They can become financial sinkholes for private investors and then taxpayers sometimes forced to bail out those investors. They can become drags on economic growth and poverty alleviation. As Esty (2004) notes, almost any study about projects means study about state involvement in projects –as regulators, owners, or both.

In this chapter, we undertake that study. Section 2 of this chapter lays a foundation for that study by defining key terms and trends related to projects and states that host them. A “project” has

broad meaning applicable to practically any commercial undertaking. Our more specific use of the term is informed by researchers in several academic fields (*e.g.*, Finnerty, 2013). For them, projects entail specific legal structures and development stages both shaping and shaped by key project owners. Here, we explain how and why.

Section 3 of this chapter discusses historic and current trends affecting the popularity of private, state, and mixed project ownership. It chronicles 800 years of project ownership practices favoring more, less, complete, and completely absent state ownership in projects as well as the reasoning for these shifts. And there have been several shifts in past 75 years alone: dominant if not exclusive state ownership in projects intended to claim the “commanding heights” of national economies in the 1950s and 1960s (Yergin & Stanislaw, 1998); 50-50 hybrid projects promoting capability complementarity and mutual consultation in strategic decision-making in the 1970s and 1980s (Raveed, 1977); fully-privatized projects to stay the “grabbing hand” of inherently inefficient, often corrupt governments in the 1990s and 2000s (Shleifer & Vishny, 1994); and “public-private partnership” projects majority-owned by private investors but including states as minority owners and implicit insurers against unforeseen travails that might threaten survival and success in the 2010s and 2020s (Inoue *et al.*, 2013).

Our view of prudential project ownership deviates somewhat from current orthodoxy. Section 4 of this chapter proposes that minority state ownership can benefit project survival and success, but only in limited circumstances where states are less able to act as predictably effective regulators assuring private owners that today’s relevant investment policies will persist over the project life-cycle. In a series of publications (James & Vaaler, 2013, 2018; Vaaler, James, & Aguilera, 2008; Vaaler & Schrage, 2009), we developed this view from IB theories of investment bargaining (Kobrin, 1979) and obsolescence (Vernon, 1971), as well as economic theories of agency (Jensen & Meckling, 1976), transaction cost minimizing (Williamson, 1975, 1985), institutional design (Henisz,

2000; North, 1990; Ramamurti, 2003), and credible signaling (Perotti, 1995; Spence, 1973). States can influence project survival and success as project owners *and* project regulators. And as Wells (2014) reminds us, their default role is regulatory. Politicians have few clear advantages and several clear disadvantages compared to private investors when it comes to owning commercial ventures and governing their operations. States more naturally play the role of public rule maker and enforcer for privately-owned projects. States able to write clearly-defined laws and regulations, predictably interpreted and enforced by well-funded agencies and courts with well-educated, public-minded ministers and judges will attract more of those projects and enjoy more of the economic benefits those projects generate.

But not all countries enjoy such institutional arrangements. When those arrangements are mutable or altogether missing, then policy stability is low and project investors are vulnerable to detrimental policy changes. In this context, state ownership is a “second-best” strategy. It signals assurance against detrimental policy lest the state suffer losses with private project investors. But state ownership can also signal interference under existing policy terms. So in host countries with low policy stability, substantial but non-controlling minority state ownership makes best sense. The dominant signal is assurance against detrimental policy changes rather than interference under existing policies. It is “credible” state ownership (James & Vaaler, 2018). Increasing either policy stability or state ownership to a controlling majority undermines this risk-reducing strategy.

Sections 5 and 6 of this chapter are devoted to empirical assessment of evidence supporting these “minority rules” for state ownership in projects. Section 5 summarizes methods used to carry out our empirical assessment. We propose that minority state ownership reduces investment risk for projects located in host countries with low policy stability. One stage where we can assess that risk-reducing effect is when projects are announced, but not yet financed. Significant delay in financing indicates increased investment risk. Banks considering billion-dollar loan commitments to a power,

water, or other infrastructure project may take up to a year after initial project announcement to agree on terms and close financing. Projects with more investment risk take more time. Thus, our empirical methods are designed to let us test conditions where announced projects experience significant delays in financing. For announced projects located in countries with low policy stability, we expect that minority state ownership reduces the likelihood of delayed financing.

Section 6 of this chapter reports results largely supporting this expectation. We analyze financing times associated with 1190 projects announced from 1990-2007 in 91 countries and intended to provide products and services in six broad industry sectors: mining, oil and gas, power generation and transmission, telecommunications, waste and recycling, and water and sewage. Regression and related analyses indicate that, for projects located in countries with low policy stability, minority state ownership reduces the likelihood of delayed project financing. Minority state ownership appears to render project lenders less hesitant to commit billions to projects where states provide less clarity and predictability about policies affecting project survival and success. We also find that projects outside this credible state ownership scenario may not avoid significant financing delays. Indeed, when host-country policy stability is low, but there is majority rather than minority state ownership, the likelihood of delayed financing is significantly increased. State ownership is less a “helping hand” and more a “hindering hand” at this important project development stage.

Section 7 concludes this chapter with a discussion of how our evidenced-based view matters for near-term management research, practice, and public policy issues involving states as project regulators and investors. From our perspective, management research has only recently discovered projects as distinct phenomena for study. Exploiting that discovery promises management researchers new insight on how state ownership matters for the daily operations as well as broader governance of critical infrastructure projects around the world. That insight has particular importance for developing countries. In 2018, project finance-based investment topped US\$280

billion with more than US\$13 billion going to public-private partnership (PPP) projects with host-country states as investors. In the last five years, both numbers have increased steadily from 15-20 percent annually (PFI, 2020).

Going into the 2020s, PPPs will become particularly important for developing countries in Sub-Saharan Africa and Southeast Asia where formerly state-owned infrastructure is undergoing partial privatization to attract foreign firms and technology while leaving states with some equity shares to oversee those activities (Park, 2018). This conjecture does not mean that PPPs have less or no relevance for strategic managers leading projects in industrialized democracies of North America, Western Europe, and Australasia. They do, but partial state ownership as a risk-reducing strategy matters less as a signal guaranteeing general policy stability. Partial state ownership matters much more as a signal of support for projects serving specific policy goals –for instance, increasing renewable energy generation in developed countries with sufficient technological capacity but insufficient commercial will to abandon existing coal- and oil-based generators swiftly and irretrievably in response to climate change (Prag (IEA), Röttgers, & Scherrer, 2018).

The 2020s will also see continuation of a trend running back at least 20 years. The economic rise of China has also seen PPPs in developing countries with minority, majority, even 100 percent Chinese state ownership. The use of home- (not host-) country ownership stakes may send a risk-reducing signal to private investors, but that purpose competes with others related to Chinese foreign policy goals. These trends mean project executives have increasing needs for thoughtful management research on whether and when to include host- and home-country states as investors. Politicians are also likely students of that management research as they mull over private investor invitations to contribute precious state equity. We think this chapter can help both constituencies make smarter choices about when and how to involve states as investors in projects with potential to generate profits and propel economic development.

2. Foundational Terms and Trends

2.1 *Project Terms*

Researchers interested in helping those constituencies will benefit from a shared understanding of foundational project concepts and trends. For many, terms like “project” or “project finance” or “project investment” have no specific meaning. They are generic terms describing a commercial undertaking or the capital supporting it. For certain academic researchers and professionals in law and finance, these terms have quite specific meanings. To appreciate those specifics, we turn to finance scholars like Esty (2004), Gatti (2013), and Kleimeier and Megginson (2000), legal scholars like Park (2018) and Schwarcz and Sergi (2008), and management scholars like Dorobantu and Müllner (2019), Müllner (2017), James and Vaaler (2018), and Sawant (2010a).

For them, a project means a single-business company typically operating in an infrastructure industry. The project’s top management team looks like any other corporate team, but project employee headcounts are typically lower than for other non-project corporations operating in the same industry. This follows from more extensive contracting with outside suppliers compared to internal employees.

-----Insert Figure 1 approximately here-----

As Figure 1 illustrates, other project structures, players, and agreements can differ from non-project corporations. Project “sponsors” provide equity and play a role similar to corporate shareholders. They provide project governance through company board members and expect regular returns through dividends paid over the project’s operational lifespan. Indeed, project sponsor agreements often fix dividend payment schedules with little or no managerial discretion to reinvest earnings. Project companies may have a broad shareholding base along with listings on public exchanges around the world, but more typically, ownership is concentrated in 1-4 sponsors

drawn from specialized investor groups, companies operating in the same industry as the project, and sometimes host-country governments (Esty 2004).

Project sponsors usually supply a relatively small percentage of overall capital. Most project financing comes from debt, typically in the form of large whole-sale loans by commercial banks. In the 1980s and 1990s, debt averaged nearly 70 percent of overall project value (Kleimeier & Megginson, 2000). By the mid-2000s it increased to almost 80 percent (James & Vaaler, 2018). Like other commercial lenders, project lenders look for high returns in the form of interest secured by assets that can be seized and liquidated in the event of project failure. In this context, it is not uncommon for prospective project lenders to demand that project companies obtain credit ratings and non-payment insurance. They may also exercise additional risk management through loan syndications and credit default swaps (Park, 2018).

A key structural characteristic of projects is their legal separation and bankruptcy remoteness from sponsors owning them. This gives project lenders strong incentives to manage investment risks as they typically have only limited recourse in the event of project failure. They can secure loan repayment with project but *not* other assets on the consolidated balance sheets of sponsors. This project characteristic contrasts with non-project corporate financing practices where sponsors guarantee project liquidity with other corporate assets and report project activities on consolidated balance sheets.

In this context, it becomes vital for prospective project lenders to exercise due diligence and negotiate detailed agreements prior to any project loan commitments. Those agreements spell out in detail how lent funds will be used for project construction and operation, what regulatory approvals will be required at different project stages, what private agreements with key suppliers and customers will be required, and how disputes with project executives and owners, particularly during periods of project distress, will be resolved. With non-project corporate-financed investment, lenders need less

information about the operational use of funds that may be allocated across several projects under the same corporate umbrella (Gatti, 2013).

Project lending agreements are only part of the broader network of contracts that project sponsors negotiate with project stakeholders. Indeed, when Jensen and Meckling (1976) first described a firm as a “nexus of contracts” they may have had project companies in mind. Since project companies are legally separate from their sponsors, they are freer to contract out many activities that employees and assets would typically support under a non-project corporate financing approach. Legal separation and extensive contracting help spread risk to different project stakeholders. Firms tend to use project investment structures and financing when capital requirements are larger and host countries riskier (Sawant, 2010a). These and other differences in project- versus corporate-based structures and financing are summarized in Table 1.

-----Insert Table 1 approximately here-----

One important contract executed in tandem with project financing involves the host-country state. For many infrastructure projects a host-country state official, ministry, or independent agency sets price and quality standards: price per kilowatt-hour of electricity generated by a power project; universal service requirements pursued by a telecommunications project; water quality standards met by a waste-water treatment project. Agreements with states set those standards as well as penalties for failing to meet them. They also often include state representations about the legality of activities during different stages of project development: caps on interest paid for loans from state-owned banks; variances from local zoning requirements during project construction; long-term drilling on public lands during project operation; obligations to set aside funding for orderly project closure and environmental monitoring (Schwarcz & Sergi, 2008).

Another important contract also often includes states, though as a customer rather than regulator or shareholder. States and state-owned enterprises are often the primary or even sole

customer for project outputs such as electrical power or recycled waste-water. Long-term agreements to “take-or-pay” (for) project outputs can be problematic to conclude with adequate guarantees. They require waiver of a state’s sovereign immunity to suit in the event of an alleged breach. Once waived, project sponsors often demand that suits for alleged breach go before foreign arbitral panels rather than local courts. In anticipation of an off-take agreement breach, project sponsors may even require that states post bonds to assure payment for damages (Gatti, 2013).

Project agreements are complex and emerge slowly. As Figure 2 indicates, project sponsors may need several months or even years to line up and then negotiate terms with prospective lenders where the cost of project debt is largely set by the market, but the quantity of debt to be committed to a project is chosen by the lenders. Sponsors that anticipate and reduce investment risks also obtain more financing more quickly from lenders. Less adroit sponsors see slower negotiations, decreased loan commitments, perhaps even impasses that stall project development indefinitely (Dorobantu & Müllner, 2019; Müllner, 2017).

Figure 2 provides a timeline of project stages and agreements, including financing agreements. In the 2000s, the average time from initial project announcement to financial closing was about 13 months. The average time from initial project announcement to commencement of project operation was about 30 months (James & Vaaler, 2018). At first and perhaps second glance, these lags might indicate undue delay. But when compared to the 20-year, 30-year, or even longer lifespan of many projects, these same lags also indicate a deliberate speed intended to anticipate and reduce risks in ensuing stages of project development.

-----Insert Figure 2 approximately here-----

Projects financed with all deliberate speed tend to see timely completion of construction and commencement of operations. High leverage and detailed contracts for the distribution of cash flows to project lenders and related suppliers reduce free cash project executives might otherwise

spend on perquisites. Concentrated ownership among a few specialized project sponsors increases incentives to monitor project construction and operation more closely. These characteristics reduce project agency costs (Jensen & Meckling, 1976). They also increase sponsor investment capacity. Legal separation and bankruptcy remoteness permits sponsors to fund projects without impairing their own corporate balance sheets. Greater use of outside suppliers means greater access to “best-in-class” suppliers connected to the project by arms-length contracts rather than employment relationships (Esty, 2004).

With these advantages, it is easy to see why project finance-based investments are so popular, particularly in developing countries. But there are also disadvantages to consider. Separate legal entities, assurances of bankruptcy remoteness, networks of contracts with a range of suppliers almost certainly raises *ex ante* project transaction costs compared to the costs of constructing and operating the same project using corporate finance and employees. But higher *ex ante* project transaction costs also mean potentially lower *ex post* agency costs, especially those agency costs related to overseeing and assuring the compliance of state-related players. These *ex post* cost advantages help us understand why projects are popular means for infrastructure investment in developing countries. During the 1990s, for example, nearly 70 percent of all foreign direct investment in the Philippines was project-based (Vaaler, 2008). Thoughtful project risk management relies on assessment of host-country macroeconomic and institutional factors together with project-specific factors, such as the identity of project stakeholders, including politicians who govern states that may hold project ownership stakes.

2.2 *Project Trends*

Origins of investment on a project basis go back to at least 1299, when the Florentine merchant banking firm, Frescobaldi, lent money to the English Crown to finance development of silver mines in Devon (Kensinger & Martin, 1988). In the mid-18th century, Junker nobles from Prussia used a

form of project finance called the *pfandbrief* to re-build estates and villages destroyed during the Seven Years War (Wandschneider, 2014). In the mid-19th century, Ferdinand de Lesseps created the Suez Canal Company investing more than US\$100 million and employing more 1.5 million workers over 10 years to build the world's then most important man-made waterway. Project operations from 1869-present fell first under the control of the Ottoman Khedive, then the British, and finally the Egyptian government (Lang, 1998). History is repeating itself in the 2020s with plans for a new Suez Canal Development Project scheduled to invest US\$8.5 billion to widen and modernize canal operations for 21st century shipping (OECD, 2018). Similarities recur across history: legal separation of the project company from its sponsors to assure bankruptcy remoteness in the event of failure; a network of agreements with different stakeholders tied to the project company rather than to its sponsors; primary reliance on bank loans rather than sponsor equity to fund project construction and operation; state involvement as a regulator setting rules for project company operation and sometimes as a project investor.

In the 2000s, projects are everywhere. Figures 3A-B present country-by-country US dollar values of all projects (3A) and those with state ownership (3B) announced worldwide from 2000-2010 (SDC, 2013). They both confirm and challenge intuition about where project activity is more and less intense. Larger developed countries like the United States (US) and Canada account for billions of dollars of project investment in both categories. Observers might expect larger numbers for state-owned projects in Canada but not so in the US, at least until noting the historical importance of individual US state (*e.g.*, California) investment projects in power and water sectors.

We also find wide variation in project activity across prominent emerging-market countries like the so-called “BRICS” of Brazil, Russia, India, China, and South Africa. All five attracted billions of dollars in project investment with the larger BRIC countries attracting more than US\$10 billion. Once limiting the sample to projects with host-country state ownership, only China still

accounts for more than US\$10 billion in project investments. One interpretation of these results would emphasize the state-directed nature of the fast-growing Chinese economy and conjecture that host-country authorities compelled state ownership in projects building and operating power generators, waste-water treatment plants, toll roads, and the like. Another interpretation would emphasize the strategic decision-making capacity of project executives interested in including states as sponsors to make them better informed, more sympathetic regulators. As James and Vaaler (2018) note, there is reason to suspect that both interpretations may have relevance for a given project and its particular context.

-----Insert Figures 3A-B approximately here-----

3. State Ownership Trends

3.1. The Post-War Trends

Prior to World War II, the notion of state ownership over the “commanding heights” of a national economy might have been limited to Leninist policy prescriptions for the newly-constituted Soviet Union. That changed with massive destruction and private-sector economic exhaustion following the six years of World War II. By the mid-1940s, policies promoting state ownership and reinvestment were widespread across Western Europe (Yergin & Stanislaw, 1998). For example, a sweeping UK Labour Party election victory in 1945 led to a string of nationalizations touching coal, railroads, utilities, and telecommunications (Morgan, 1984). These policies emphasized advantages in state financing and coordination as well as “natural” economies of scale from consolidation of many private suppliers into single public-owned enterprises that would “democratize” industries thought to be historically controlled by and run for wealthy elites (Posner, 1969). Implementation of these nationalization policies in Britain, France, Italy, West Germany, and the Benelux countries set examples for colonies in Africa and Asia gaining independence from the late-1940s to the mid-1960s. Ghana’s founding chief executive, Kwame Nkrumah, reiterated Lenin’s promise to take the

“commanding heights” of the economy when placing the country’s major corporations under the direction of government ministers in the late-1950s and early-1960s. (Mazrui, 1966).

Views about state ownership in infrastructure industries began shifting in the 1960s. In Western Europe and much of the developing world, increasing state ownership coincided with steady economic growth and increasing wealth. In certain parts of the Academy, however, there emerged a new generation of scholars articulating drawbacks to state ownership, such as less effective monitoring (Alchian, 1965), lower rates of innovation (Kirzner, 1973), and the potential for politically-motivated abuse (Friedman, 1962).

One response to this new scholarship touted the value of joint ventures evenly sharing ownership between state and private owners.¹ By the mid-1970s, US media were noting substantial increases in private-state joint ventures, especially between multinational enterprises (MNEs) and states in developing countries (Janssen, 1973). In what appeared to be natural complementarity, MNEs brought capital, technology, and international market access to a venture, while host-country governments brought local land, labor, and domestic market access. MNEs assured productive efficiency generating profits while states assured allocative efficiency generating welfare.

But differences in MNE versus state aims paired with a 50-50 equity split could generate unresolvable conflicts in governance with debilitating effects on joint-venture survival and success. Raveed (1977) documented conflicts in such joint ventures in Colombia during the 1970s. There, MNE owners lamented the “political” objectives of state representatives on venture boards while those state representatives voiced suspicion of foreign profiteering by their MNE co-investors.

3.2. Post-Cold War Trends

¹ In the 2020s, these private-state joint ventures are more likely to be described as public-private partnerships (PPPs). That PPP description could be mistaken. Many are not based on shared ownership. Indeed, the state’s involvement in the project may be completely unreliant on project equity. Instead, state involvement may depend entirely on PPP agreements granting rights of notification, veto, or absolute control over certain project activities (see, *e.g.*, Kivleniece & Quélin, 2012).

Yergin and Stanislaw (1998), Megginson and Netter (2001) and others chronicled a history of state divestment from enterprise ownership reaching at least as far back as West Germany's partial sell-off of state ownership in Volkswagen. Then known as "denationalization," state divestment policies in the 1970s emerged in the UK and then elsewhere in Western Europe during the 1980s with a "privatization" label. Justifications for swift, often complete state divestment from several infrastructure industries echoed 1960s academic critiques, particularly those from University of Chicago economists and legal scholars. By the 1980s, chronic budget deficits in many Western European countries added a practical justification. Industry privatizations offered states an opportunity to pay for social programs and balance budgets with proceeds from private equity placements and broader share offerings. Thus, privatization policies in the 1980s gained popular support for practical fiscal and ideological reasons. Early evidence pointed to the wisdom of these policies. Privatized enterprises in Western Europe exhibited more efficient and profitable operations than state-owned counterparts (Megginson & Netter, 2001). Even partial privatization increased enterprise performance while share listings from privatization increased the size and liquidity of local share markets (Gupta, 2005).

With the fall of the Berlin Wall in 1989 and collapse of the Soviet Union in 1990, another opportunity for implementation of privatization policies in the developing world emerged. This change coincided with the emergence of so-called "Washington Consensus" policies (Williamson, 1989) favoring complete privatization of state-owned enterprises often dominating power, water, transport, and other infrastructure industries in developing countries. State ownership no longer positioned governments to lend a helping hand to its citizens. It was now a hindering hand deterring private, often foreign investors. Or it was a "grabbing" hand ruinously taxing individuals and firms while corruptly favoring political cronies with no-show jobs, no-bid contracts, and no-interest loans (Shleifer & Vishny, 1994). The prescriptive implication for emerging-market countries in Latin

America, transition countries of the former Soviet Union, developing countries in Southeast Asia, and impoverished and violence-prone countries in Sub-Saharan Africa was the same: privatization, and in most cases, 100 percent privatization (Boycko, Shleifer, & Vishny, 1996).

3.2. Current Trends

The last 20 years have seen the pendulum swing back toward some shared state-private co-ownership, but with different owner shares and different ownership assumptions in mind. We already noted the often divergent interests of politicians and private investors. If deadlocked in 50-50 co-ownership arrangements, then divergent interests would be unresolved and projects immobilized by indecision. In the early 1990s, that prospect seemed to confirm the wisdom of complete divestment consistent with Washington Consensus policies.

But implementation of those same policies suggested a different approach. While advising governments on the privatization of state-owned enterprises in Central Europe in the early-1990s, Perotti and Guney (1993) noticed a pattern. Even though Central European governments could have fully divested in one private placement or public offering, they chose to divest in successive tranches. Initially, 10 percent would be sold in a private placement with a select group of foreign investors. Six months later, another 30 percent would again be placed, perhaps to a mix of private foreign and domestic investors. Six months later, another 40 percent would be sold off to a different private investor group. In the end, the privatized manufacturer or bank would be 80 percent privately owned, but the state would retain a 20 percent minority equity stake.

In terms of governance, private investors with profitability goals would dominate, but some residual state ownership was also advantageous. It sent a signal of state support for enterprise success. It was also a signal of state commitment to keeping promises made to private investors. For a privatizing car manufacturer, it rendered more credible a state commitment to buy a pre-set number of autos at a pre-set price annually for the next 10 years. For a privatizing bank, it rendered

more credible a state commitment to guarantee the repayment of up to US\$5 million in small business loans made annually for the next 10 years. For any privatizing enterprise, it rendered more credible a general state commitment to stabilize policies relevant to investors over successive business cycles. Minority state ownership promised stability lest the value of state equity in a given enterprise decrease with private investors.

Perotti (1995) formalized these practices in a “credible” privatization model grounded in signaling theory (Spence, 1973). In his model, a sequence of partial divestments with no change in relevant policies signals to private investors that the state is committed to restraint, that it will not renege in the near term on policies to the detriment of private investors –think, for example, how a state might save money by suddenly withdrawing its repayment guarantee to a privatizing bank. As the potential for sudden policy change increases, “a larger stake must be retained to signal commitment” (1995: 853). Vaaler and Schrage (2009) elaborated on what that “larger” state ownership stake might be. Analyses of sequential divestments for 15 privatizing telecoms in the 1980s and 1990s suggested that retention of a 25-30 percent state equity stake maximized financial returns indicative of greater investor confidence.

Indeed, credible privatization models seemed best tailored to politicians and enterprises in developing countries. There, politicians have a greater ability to change policies beneficial or detrimental to private investors: taxes, royalties, local environmental regulations, domestic content and labor requirements, rules on repatriating profits, rules for resolving disputes with local firms or local public agencies. These policies affect private investors, particularly foreign private investors, who depend on policy stability when making “sunk-cost” investments supporting infrastructure projects meant to operate for decades.

States do not always oblige. Ecuador’s President Raphael Correa serves as an example. When elected in 2007, he immediately increased corporate taxes from 30 percent to 50 percent. He soon

imposed a petroleum “windfall” profit tax of 99 percent. He then forced private foreign investors to divest from most petroleum enterprises, but continue operations under service contracts overseen by Correa’s office (Musacchio, Goldberg, & Reisen de Pinho, 2009). Correa’s policy shifts were extreme but not unique. In many developing countries, new administrations come to power with mandates to change investment policies deemed as “giveaways” to private investors and “unfair” to governments and their citizens (Ramamurti, 2003).

Some developing countries are more and some less prone to such sudden policy changes. Academic and public policy researchers even have measures for policy stability. Those measures look at the formal system for changing laws in a given developing country and count the number of steps a proposed law must take before becoming enforceable. At each step there is some individual (*e.g.*, president) or group (*e.g.*, chamber of deputies) that can stop the process, that is, “veto” it. Where the number of veto players is lower (higher), policy stability is lower (higher). Two prominent measures of policy stability based on this approach are the “checks and balances” score developed by Beck, Clarke, Groff, Keefer, and Walsh (2001) and the “polcon” (political constraints) score developed by Henisz (2000).

Policy stability matters to investors, whose skepticism about policy stability might disqualify countries for investment (Henisz & Macher, 2004) or at least decrease investment levels (Delios & Beamish, 1999). Indeed, policy stability concerns can trump benefits host-country states often use to attract investors –for example, multi-year tax holidays. No matter how attractive those benefits might seem, savvy potential investors have in mind an obsolescing bargain (Vernon, 1971) that would replace beneficial with detrimental policies like those imposed by Ecuador’s Correa. Ramamurti (2003) thought this imposed an “institutional” challenge on most developing-country states. Somehow, they needed to make credible commitments to maintaining policies over time and inevitable change in governing parties and policy priorities. A substantial but non-controlling equity

stake in privatizing enterprises or in altogether new infrastructure projects might provide that credibility in developing countries. We describe when and how below.

4. Credible State Ownership and Project Financing Speed: Theoretical Considerations

Where policies are stable, private investors may see little advantage in adding states as investors. The additional assurance is superfluous. It is when policies are not stable that private investors eye the state as an investor able to provide second-best assurance against detrimental policy change in the near term. But that state investment ought to be non-controlling lest politicians take the reins of project governance under existing policies and direct it toward welfare rather than profitability.

Following Perotti (1995), James and Vaaler (2018) thought this reasoning followed in large part from signaling theory, which holds that economic agents interacting without important information often use costly cues to suggest what that missing information is. Spence (1973) developed signaling theory to explain certain labor markets where job applicants signal quality to prospective employers through costly education. Signaling theory helps explain many other transactional contexts. Firm executives signal confidence to existing shareholders after a big corporate investment by taking more stock themselves (Goranova, Alessandri, Brandes, & Dharwadkar, 2007). Entrepreneurs signal confidence to potential investors during an initial public offering by retaining a substantial equity stake in the firms they founded and grew (Downes & Heinkel, 1982).

When applied to projects, James and Vaaler (2018) thought state equity sent two signals to private investors. One signal is assurance, that is, assurance from host-country governments that initial policies under which investments were made would remain in place. The other signal is interference, that is, interference from host-country governments under those same initial policies. Figure 4 illustrates when these signals of assurance and interference emerge and when each dominates the other.

-----Insert Figure 4 approximately here-----

4.1. *State Ownership and Project Financing Speed*

We can give that illustration context. Consider the second stage of project development, that is, the time after initial project announcement but before the project financing agreement is concluded. In developing countries where policy stability may be low, a state ownership stake in the project sends a signal of assurance to prospective lenders that contractual terms involving the state and broader legal and regulatory arrangements amenable to change by the state will remain unchanged in the near term. In Figure 4, more state ownership in the project linearly increases signal strength and decreases the likelihood of significant delay in financing.

But Figure 4 also includes a second interference signal that emerges and then strengthens non-linearly. It emerges when state ownership becomes substantial. It varies by project context, but research by Vaaler and Schrage (2009) and James and Vaaler (2013, 2018) suggests emergence when state equity exceeds 20-30 percent. From there, state investors have more opportunities to debate and dissent from project strategies serving the profitability aims of private investors. As state ownership increases, so, too, does opportunity to influence project strategy in favor of other goals servicing politicians –increasing employment, wages and salaries, job security, preferential pricing for state customers. While socially laudable and politically attractive, such changes may also impair repayment of principal and interest to prospective project lenders at the negotiating table with project sponsors. In Figure 4, that second interference signal is dominated by the first assurance signal, but when state ownership exceeds 50 percent and states become majority owners then dominance shifts and the likelihood of significant delay or even failure in reaching terms on project financing increases more.

These theoretical considerations give rise to a testable hypothesis where the two key project factors affecting financing speed are host-country policy stability and state ownership. To wit:

Hypothesis 1: For projects located in countries with low policy stability, the likelihood of delayed financing decreases with minority state ownership.

4.2. Different Types of State Ownership and Project Financing Speed

Using Perotti's (1995) terminology, projects fitting the description in Hypothesis 1 have credible state ownership. The two key factors are present: low policy stability and non-controlling state investment with assurance as the dominant signal. But what if one or both key factors are missing. Figure 5 helps us answer that question. This two-by-two matrix describes four scenarios based on whether there is minority or majority state ownership in a project (x-axis) and whether the project is located in a host country with low or high policy stability (y-axis).

-----Insert Figure 5 approximately here-----

The credible state ownership scenario is located in Quadrant 3 of Figure 5. To the right is Quadrant 4 describing a different scenario. There, host-country policy stability is still low, but states have majority state ownership. We call this an interfering state ownership scenario. Compared to Quadrant 3, the likelihood of financing delay should be higher. State owners have a controlling share of project equity and can re-direct project managers to pursue broader welfare-oriented goals under existing policies. That prospect signals interference rather than assurance to prospective lenders and slows negotiations toward a financing agreement advancing project development.

Next, consider Quadrant 1 above Quadrant 3. There, host-country policy stability is high and states can make credible policy commitments. Projects in Quadrant 1 also have minority state ownership. We call this a superfluous state ownership scenario. Compared to Quadrant 3, the likelihood of financing delay should again be higher, but for slightly different reasons than for Quadrant 4's interfering scenario. The assurance signal that might otherwise dominate with minority state ownership is irrelevant where policy stability is high. But state interference under existing policies is still relevant and possible with emergence of some substantial but non-controlling

state investment. That prospect may delay negotiation of a financing agreement with prospective lenders.

Finally, consider Quadrant 2 on the diagonal from Quadrant 3. There, host-country policy stability is again high and states can make credible policy commitments. Projects in Quadrant 2 also have majority state ownership. We call this an ideological state ownership scenario. Compared to Quadrant 3, the likelihood of financing delay should again be higher for some of the same reasons as in Quadrant 1 only more so. The assurance signal that might otherwise dominate with majority state ownership is irrelevant where policy stability is high. But state interference under existing policies is still relevant and inevitable with controlling state ownership. The near certainty of project diversion to serve welfare goals primarily may delay negotiation of a financing agreement with prospective lenders.

Of course, there could be compensating factors that may still prompt private investors to seek out states as project owners or compel states to impose on private investors as an equity partner. Musacchio and colleagues tout several advantages associated with “state capitalism” (Inoue *et al.*, 2013; Musacchio & Lazzarini, 2014; Musacchio, Lazzarini, & Aguilera, 2015; Wright, Wood, Musacchio, Okhmatovskiy, Grosman, & Doh, 2021). Partial state ownership enriches and diversifies enterprise capital funding daily enterprise operations. It gives politicians incentives to assist enterprise executives when encountering a private business opportunity or obstacle where policy changes might resolve the matter. Perhaps most importantly, it means better access to public goods and capital, particularly when the enterprise faces a sudden downturn. State ownership signals state insurance, perhaps in the form of emergency government loans during a liquidity crisis, perhaps in the form of government purchases of enterprise goods during a demand crisis. These advantages might lead to a prescription for some substantial but non-controlling state ownership in projects to obtain these advantages with less concern about state interference.

When applied to projects located in host countries with low policy stability, we tend to agree with this alternative view. Not surprisingly, most illustrations of this alternative view involve host countries with low policy stability (*e.g.*, Brazil) and enterprises with minority state ownership (*e.g.*, Brazil's Vale). But when projects are outside this credible state ownership scenario in Quadrant 3, the advantages may quickly fade for reasons summarized above and in Figure 5.

Compared to projects located in the other three quadrants, investment risk and prospective lender concerns should be lower in Quadrant 3. These theoretical considerations again suggest a testable hypothesis. To wit:

Hypothesis 2: The likelihood of delayed financing is lower for projects in Quadrant 3 (credible state ownership scenario) compared to Quadrants 1, 2, and 4.

5. Credible State Ownership and Project Financing Speed: Empirical Methods

5.1. Data Sources and Sampling

We can assess empirical support for these two hypotheses. To do so, we first describe key methodological steps: data sources and sampling, empirical model terms and implied tests, and estimation strategies. We start with our key data source, the Securities Data Company (SDC) investment project database (SDC, 2013) provided by Thomson-Reuters. Beginning in the late 1980s, the SDC database provides information about projects announced and intended for financing, construction and operation around the world. Project information is compiled from on-going review of filings with securities regulators like the US Securities Exchange Commission and mass-market media publications like London's *Financial Times* newspaper. We collect a sample of projects announced from 1990-2012 and intended for financing, construction and operation in one of 95 host countries across six broad industries: mining, oil and gas, power generation and transmission, telecommunications, waste and recycling, and water and sewage.

Our aim is to understand how state ownership and host-country policy stability affect project financing speed. Consistent with that aim, we sample from announced projects with at least

five years of subsequent coverage by SDC to understand whether and when financing was arranged and reported. Thus, we limit our sampling to projects announced fewer than five years before our data end in 2012 (2007).

Our resulting sample consists of 1190 projects announced in 91 host countries² and intended to operate in the six industries noted previously. This sample of projects represents wide variation across host countries (*e.g.*, France and Mozambique), industries (*e.g.*, power and telecommunications), project ownership types (*e.g.*, closely-held private and publicly-owned listed), and project size (US\$50 million and US\$3 billion). Of the 1190 projects, 153 or 13 percent include the state as a minority or majority owner.

SDC provides data for several of these variables, including *Delayed Financing*, our dependent variable, and *Minority State Ownership*, a key independent variable. SDC also provides data for several control variables used in our regression analyses: *Project Size*, *Syndicate Ownership*, *Percent Domestic Offtake Contract*, *Project Bid*, *Lead Sponsor Experience*. Data for another key independent variable, *Policy Stability*, come from the World Bank's Database of Political Institutions (DPI) (Beck *et al.*, 2001; Keefer & Stasavage 2003). Bloomberg (2020) provides data for another control variable, *Country Rating*. The World Bank's World Development Indicators (WDI, 2020) and Index Mundi (2020) and InflationData.com (2020) provide data for another control variable, *Industry Demand*.

5.2. Model Terms, Measures, and Testing

We define two models to test our two hypotheses. Terms in Equation 1 permit tests of Hypothesis

1. Terms in Equation 2 permit tests of Hypothesis 2. Both models feature the same dependent

² The 91 host countries are: Albania, Algeria, Angola, Argentina, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belgium, Bolivia, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Finland, France, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Libya, Lithuania, Madagascar, Malaysia, Mali, Mexico, Moldova, Morocco, Mozambique, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Kingdom, United States, Uruguay, United Arab Emirates, Venezuela, Vietnam, and Zambia.

variable, *Delayed Financing*. It is a 0-1 indicator variable taking the value of one when the number of days from initial project announcement date to project financing date exceeds by one standard deviation the average number of days from announcement to financing. The sample mean is 453 days with a standard deviation of 634 days.

Equation 1 explains variation in *Delayed Financing* with right hand-side terms listed below:

$$\begin{aligned}
 \text{DelayedFinancing}_{ijkt} = & \alpha + \gamma \sum_{\gamma=1}^{\gamma=6} \text{Project Controls}_{ijkt} + \chi_1 \text{Industry Demand}_{jkt} + \delta_1 \text{Country Rating}_{kt} \\
 & + \beta_1 \text{Policy Stability}_{kt} + \beta_2 \text{Minority State Ownership}_{ijkt} \\
 & + \beta_3 \text{Minority State Ownership} * \text{Policy Stability}_{ijkt} + \pi \sum_{\pi=1}^{\pi=5} \text{Industries}_j + \varepsilon_{ijkt}
 \end{aligned} \tag{1}$$

In Equation 1, *Delayed Financing* is regressed on a constant (α), project-specific control variables (γ_{1-6}), an industry control variable (χ_1), a host-country control variable (δ_1), host-country policy stability (*Policy Stability*) (β_1), whether the host-country state holds a minority ownership stake in the project (*Minority State Ownership*) (β_2), their interaction (*Minority State Ownership*Policy Stability*) (β_3), industry (π_{1-5}) dummy variables, and an error term (ε). Subscripts i, j, k , and t denote project-specific (i), industry-specific (j), country-specific (k), and time- (year-) specific (t) terms. Equation 1 includes both time-variant (*Industry Demand_{jt}*) and time-invariant (*Industries_j*) terms. Definitions, measures, data sources, descriptive statistics, and predicted relationships with *Delayed Financing* for all Equation 1 terms are presented in Table 2.

-----Insert Table 2 approximately here-----

Three right hand-side terms in Equation 1 merit short discussion. *Policy Stability* is the natural logarithm of a “checks and balances” score published in the World Bank’s DPI (Beck *et al.*, 2001; Keefer & Stasavage 2003) for each host country annually. The nominal (unlogged) score ranges from 1-18, with 1 indicating essentially no checks on proposed policy changes and 18 reflecting substantial checks on the same. We use *Policy Stability* to assess ease in changing policies relevant to

assessment of project investment risk. It counts the number of veto players in a host-country's national polity. Higher *Policy Stability* scores imply more veto players and higher policy stability that should decrease the likelihood of delayed project financing.

Minority State Ownership is a 0-1 indicator term taking the value of one when the state has some non-zero project equity stake, but less than 50 percent. SDC provides data for *Minority State Ownership*. On its own, *Minority State Ownership* is expected to increase the likelihood of delayed project financing since it indicates some potential for political interference.

We also include in some Equation 1 specifications the interaction term, *Minority State Ownership*Policy Stability*. For our purposes, it measures the change in *Minority State Ownership* effects on *Delayed Financing* as *Policy Stability* increases. When included in Equation 1, the interaction term changes the meaning of *Policy Stability* and *Minority State Ownership*: *Policy Stability* then measures the impact of policy stability on *Delayed Financing* when a project has either no state equity or majority state equity; *Minority State Ownership* then measures the impact of some non-controlling state equity share when there is no or very low host-country policy stability. We estimate Equation 1 with the full sample of 1190 projects and with different sub-samples permitting investigation of key assumptions in our theoretical framework. Hypothesis 1 predicts that the coefficient for *Minority State Ownership* will exhibit a negative sign indicating a lower likelihood of delayed financing when host-country policy stability is low.

To test Hypothesis 2, we specify a slightly different model. Equation 2 retains the same dependent variable and right hand-side control terms but replaces key right-hand terms from Equation 1 so that we can compare the likelihood of delayed financing for projects in different quadrants of Figure 5.

Equation 2 explains variation in *Delayed Financing* with right hand-side terms listed below:

$$\begin{aligned}
\text{DelayedFinancing}_{ijkt} = & \alpha + \gamma \sum_{\gamma=1}^{\gamma=6} \text{Project Controls}_{ijkt} + \chi_1 \text{Industry Demand}_{jkt} + \delta_1 \text{Country Rating}_{kt} \\
& + \phi_1 \text{Superfluous State Ownership}_{kjt} + \phi_2 \text{Ideological State Ownership}_{ijkt} \\
& + \phi_4 \text{Interfering State Ownership}_{ijkt} + \pi \sum_{\pi=1}^{\pi=5} \text{Industries}_j + \varepsilon_{ijkt}
\end{aligned} \tag{2}$$

In Equation 2, we replace *Policy Stability*, *Minority State Ownership*, and *Minority State Ownership*Policy Stability* terms with three (0-1) indicator variables. *Superfluous State Ownership* is a 0-1 indicator term taking the value of one for projects located in host countries with *Policy Stability* measures above the sample mean of 1.32 and non-zero state ownership less than 50 percent. *Ideological State Ownership* is the same for projects located in host countries with *Policy Stability* measures above the sample mean of 1.32 and state ownership is equal to or greater than 50 percent. *Interfering State Ownership* is the same for projects located in host countries with *Policy Stability* measures below the sample mean of 1.32 and state ownership is equal to or greater than 50 percent. We estimate Equation 2 with a subsample of 153 projects including some state ownership. Hypothesis 2 predicts that coefficients for *Superfluous State Ownership*, *Ideological State Ownership*, and *Interfering State Ownership* will exhibit positive signs indicating that, relative to projects in the credible state ownership scenario, projects in these alternative scenarios have a higher likelihood of delayed financing.

5.3. Model Estimation

Since *Delayed Financing* is a 0-1 indicator term, we use a non-linear probit estimator. We also cluster standard errors on host countries to reflect the possibility of non-independence for project observations in a given host country. We check our core probit regression results for Hypothesis 1 with an alternative ‘‘Heckprobit’’ estimator (Heckman, 1979). Designed to adjust for possible sample selection bias, this alternative essentially implements two probit estimations. The first stage equation estimates the likelihood that a project includes any state ownership. The second stage probit then estimates Equation 1 given that previous likelihood. We use Stata version 13 (StataCorp, 2013) to implement both probit and Heckprobit estimations.

6. Credible State Ownership and Project Financing Speed: Empirical Results

6.1. Preliminary Results

Figures 6 and 7 provide preliminary insights on trends connecting project state ownership to project financing speed. Figure 6's bar chart measures percentages of projects from our 1190 sample with delayed financing across six categories. The first four bars measure percentages for 38 projects in superfluous, 47 in ideological, 33 in credible, and 35 in interfering state ownership scenarios. The last two bars measure percentages for projects with no state ownership (*NS*). The *NS Stab* bar measures the percentage of delayed financing for 710 projects located in host countries with *Policy Stability* scores above the sample mean of 1.32. The *NS Unstab* bar measures the same percentage for 327 projects located in host countries with *Policy Stability* scores below the same sample mean.

Figure 6 provides interesting preliminary insights related to our hypotheses. Only 15 percent of projects experience delayed financing in the credible state ownership scenario. That compares with 26 percent in superfluous, 28 percent in ideological, and 31 percent in interfering state ownership scenarios. This pattern is consistent with Hypothesis 2's prediction of less likely financing delay when there is the "right" mix of low host-country policy stability and minority state ownership.

An example of that right mix might be Portugal's Eolica da Alagoa wind power project first announced in February 2005. Pictured in Figure 2, the US\$21 million project included 20 percent ownership by the Portuguese City of Arcos. Since Portugal's policy stability score is below the sample average and there is minority state ownership, this project fits neatly into the credible state ownership scenario. Financing closed 27 days later. Contrast that with another power project located in Portugal and pictured in Figure 2. The Amper Central solar power project was first announced in October 2003. The US\$405 million project was 100 percent owned by the City of Moura, thus putting it squarely in the interfering state ownership scenario. It took almost five years

to arrange financing.

While there are some clear differences in financing speed for projects with some state ownership, there are not for projects without it. Indeed, we find no substantial percentage differences for projects with no state ownership, that is, *NS Stab* and *NS Unstab*. About 18 percent of projects experience delayed financing whether they are located in host countries with above- or below-average *Policy Stability* scores.

-----Insert Figure 6 approximately here-----

Figure 7's linear trend-line analyses also provide important preliminary insights related to our hypotheses. 71 of the 1190 projects sampled have some level of minority state ownership (1-49 percent). The x-axis of Figure 7 measures that percentage of minority state ownership while the y-axis measures the logged days from initial project announcement to financing. There is a solid trend line for projects (●) located in host countries with *Policy Stability* scores above the 1.32 sample mean. An essentially flat solid trend line suggests that state ownership has little effect on financing speed for projects located in host countries with high policy stability. There is also a second dotted trend line for projects (x) located in host countries with *Policy Stability* scores below the 1.32 sample mean. Here, we see a clear downward slope suggesting that increasing, but still non-controlling minority state ownership is associated with higher financing speed. Project sponsors and prospective lenders take less time from announcement to assess project risks and agree on financing terms. The contrasting trend lines in Figure 7 are consistent with Hypothesis 1.

-----Insert Figure 7 approximately here-----

6.2. Core Probit Regression Results

Probit regression results reported in Table 3 build on these preliminary insights. Column 1 regresses *Delayed Financing* on all right hand-side controls using the full sample of 1190 projects. Coefficients for five of eight controls exhibit expected signs: *Project Size*, *Percent Domestic*, *Offtake Contract*, *Lead*

Sponsor Experience, Country Rating. Two of the five are significant at commonly-accepted levels ($p < 0.10$): *Project Size* and *Country Rating*. Perhaps unsurprisingly, larger projects located in host countries with less creditworthy governments are more likely to experience delayed financing.

-----Insert Table 4 approximately here-----

Column 2 adds *Policy Stability* and a continuous (0-100%) measure of state ownership (*Percent State Ownership*). Column 3 replaces the continuous measure of state ownership with the 0-1 dummy variable *Minority State Ownership*. In neither column does the coefficient for state ownership exhibit a sign significant at commonly-accepted levels. These results are consistent with Hypothesis 1, which predicts that *Minority State Ownership* decreases the likelihood of delayed financing *only* when host-country policy stability is low.

Column 4 permits a direct test of Hypothesis 1. With the addition of the *Minority State Ownership*Policy Stability* interaction term, *Minority State Ownership* now captures the impact of non-controlling state ownership when host-country policy stability is near zero. Consistent with Hypothesis 1, the coefficient *Minority State Ownership* exhibits a negative sign significant at the five percent level ($\beta_2 = -0.78, p < 0.05$). The coefficient on *Minority State Ownership*Policy Stability* exhibits a positive sign significant at the one percent level ($\beta_3 = 0.58, p < 0.01$). As host-country policy stability increases, the risk-reducing impact of non-controlling state investment in a project diminishes.

We can visualize these effects. Zelner's (2009) "intgph" software program is an add-on to Stata. It permits post-estimation calculation and graphical presentation of marginal effects related to interaction terms used in non-linear models. In our context, the intgph software uses probit results from Column 4 to calculate and graph *Policy Stability* effects on *Delayed Financing* when the *Minority State*

Ownership 0-1 indicator term takes the value one. Other right hand-side terms are held at their mean levels. We add to those estimates in bands equivalent to a five percent level of confidence ($p < 0.05$).

Figure 8 presents the results. At low *Policy Stability* scores running from nearly zero to just below one (0-3 range based on nominal *Policy Stability* scores) the likelihood of delayed financing is significantly lower. For mid-range *Policy Stability* scores running from one to about two (3-8 range based on nominal *Policy Stability* scores), the likelihood of delayed financing is neither significantly higher nor lower. *Policy Stability* scores above two (8-18 range based on nominal *Policy Stability* scores) lead to significantly higher likelihood of delayed financing.

Results graphed in Figure 8 support Hypothesis 1. When host-country policy stability is low, the addition of some non-controlling state ownership to the project provides credible assurance helpful to project financing speed. In our sample, such host countries would include Indonesia in the 1990s and Qatar in the 2000s. That risk-reducing effect diminishes to insignificance for host countries with mid-range policy stability –say, Hungary in the 2000s. Indeed, minority state ownership may even significantly increase the likelihood of delayed financing for host countries with legal and regulatory institutions already providing credible assurance that relevant policies will not change in the near term. Projects located in the US, UK, France, and other well-established democracies fit this description.

Column 5 reports results based on the sub-sample of 153 projects with some state ownership. The coefficient on *Minority State Ownership* again enters with a negative sign, significant at the 10 percent level ($\beta_2 = -1.23, p < 0.10$). Some non-controlling state ownership again decreases the likelihood of financing delays for projects located in host countries with low policy stability. In

Column 5, it does so compared to projects with majority state ownership and a dominant signal of interference rather than assurance.

Column 6 reports results from estimation of Equation 2 useful for testing Hypothesis 2. After controlling for other factors, we expect that the likelihood of delayed financing will be significantly lower for projects in the credible state ownership scenario compared to other scenarios depicted in Figure 5. Column 6 results provide mixed support for that expectation. Consistent with Hypothesis 2, we find that coefficients for all three alternative scenarios are positive, which indicates a greater likelihood of delayed financing compared to the omitted credible state ownership scenario. But only one positive term is also significant at commonly-accepted levels, *Interfering State Ownership* ($\phi_4 = 0.83$, $p < 0.10$).

These results might follow simply from the substantially lower estimation power we have with only 153 rather than 1190 observations. Column 7 results investigate that conjecture. We re-estimate using the full sample of 1190 observations. We also add two additional 0-1 indicators terms for two non-state ownership scenarios corresponding to the last two bar carts in Figure 6: *NS Stab* and *NS Unstab*. Now, coefficients for Quadrants 1 (*Superfluous State Ownership* ($\phi_1 = 0.59$, $p < 0.10$)), 2 (*Ideological State Ownership* ($\phi_2 = 0.66$, $p < 0.10$)), and 4 (*Interfering State Ownership* ($\phi_4 = 0.73$, $p < 0.01$)) are both positive and significant at 10 percent or better levels. We take these results as support for our conjecture. More broadly, they are also consistent with Hypothesis 2's prediction that projects lacking either or both of the key factors in the credible state ownership scenario will not enjoy the risk reducing advantages that those two factors together generate.

6.3. Additional Regression Results

Columns 8-10 present results obtained after changes in sampling, model specification, and or estimation strategies. All are relevant to Hypothesis 1. In Column 8 we sub-sample projects with no state ownership or minority state ownership (0-49 percent). That is, we exclude projects with majority

state ownership. The resulting sub-sample of 1108 projects permits a test of Hypothesis 1 where the risk-reducing effects of *Minority State Ownership* (after inclusion of the *Minority State Ownership*Policy Stability* interaction term) are compared to projects with no state ownership. Again consistent with Hypothesis 1, we observe a negative sign on *Minority State Ownership* significant at the five percent level ($\beta_2 = -0.73, p < 0.05$).

Column 9 presents results based on the same sub-sample, but here we drop the *Minority State Ownership* 0-1 indicator and replace it with a continuous measure of state ownership, *Percent State Ownership*. We also replace the *Minority State Ownership*Policy Stability* interaction term with a *Percent State Ownership*Policy Stability* interaction term (β_{3B}). We again observe similar results consistent with Hypothesis 1. *Percent State Ownership* is negative and significant at the one percent level ($\beta_{2A} = -0.03, p < 0.01$). For projects in host countries with low policy stability, the likelihood of delayed financing decreases more as non-controlling state equity goes from vanishing to substantial.

In Column 10, we report results after modifying both the model and estimation strategy. For some projects, the decision to include any state ownership precedes the level of state ownership. If there is such a preliminary decision, then we can model it with an alternative two-stage estimator. In the first stage of this Heckprobit model, we estimate a first-stage equation where the dependent variable is *State Ownership*, a 0-1 indicator term taking the value of one when a project includes any state ownership.

To identify this first-stage model separately from the second-stage model, we drop *Minority State Ownership*, *Policy Stability* and their interaction. We add a new right hand-side term, *Competitive Legislature*. *Competitive Legislature* is a 0-1 indicator equal to one when the host country has a competitive legislative electoral system according to the World Bank's DPI. The DPI measures legislative electoral competitiveness with a variable named "liec" (Beck *et al.*, 2001). It is a 1-7 ordinal measure where seven signifies a competitive legislative electoral system. *Competitive Legislature* takes the

value of one when the DPI liec score is seven. This term has sample mean of 0.86 and standard deviation of 0.35. We expect *Competitive Legislature* to be negatively associated with the likelihood of any state ownership. Political science research suggests that legislators fearing voter backlash at the polls are more likely to refrain from mandating state ownership in the economy lest they become vulnerable to criticisms of political cronyism (Schultz & Weingast 2003). Results from first-stage probit estimation in Column 10 are consistent with this suggestion. *Competitive Legislature* enters with a negative sign significant at the five percent level ($\omega_1 = -0.48, p < 0.05$). Host countries with more competitive electoral systems are less likely to attract projects including host-country government ownership.

Column 10 reports the second-stage of the Heckprobit estimation.³ We again find support for Hypothesis 1. *Minority State Ownership* enters with a negative sign significant at the five percent level ($\beta_2 = -1.06, p < 0.05$). Even after reasonable changes in sampling, model specification, and estimation strategies, we observe the same trend. When host-country policy stability is low, then non-controlling state ownership decreases the likelihood of delayed financing. Financing speed increases with the helping hand of minority state ownership. When host-country policy stability is middling, that helping hand disappears. Indeed, it becomes a hindering hand when policy stability is high and minority state ownership apparently slows rather than speeds project financing. It takes just the right institutional conditions and just the right level of state ownership for project investors to benefit from state involvement as an equity partner.

7. Concluding Discussion

7.1. Key Points

Recall the issues motivating our study and the broader discussion in this chapter. State ownership in projects has always been important for business performance and broader economic development

³ Results from the first-stage model estimation are available from the authors.

research. But opinions, theories, and evidence have generated inconsistent, sometimes even contradictory explanations about when and how state ownership reduces investment risk, influences project survival and success, and enhances host-country economic growth and poverty alleviation. We tried to sort out these explanations, first by analyzing in depth project structures and strategies, and state roles in each. We then reviewed historical trends in projects and state ownership.

That review led to development of our own distinctive theoretical framework to explain when and how state ownership in projects was more likely to reduce investment risk and advance project development at a critical financing stage. When projects are located in host countries with low policy stability, then substantial but non-controlling minority state ownership can reduce investment risk by credibly signaling commitment to maintain current policies lest the state also suffer losses with other project stakeholders. This assurance signal dominated over an alternative interference signal as long as state ownership remained non-controlling. Prospective lenders responded positively to that assurance signal, so that project financing was less likely to be delayed.

Our empirical study supported hypotheses derived from our framework. Simpler descriptive and more complex regression and post-estimation simulation analyses demonstrated that announced projects across a range of industries and sizes were less likely to experience a significant delay in closing on financing when located in a host country with low policy stability and some level of minority state ownership. We demonstrated that absolutely and in comparison to other discrete scenarios where one or both key factors in our theoretical framework were missing. Our findings suggested that state ownership can reduce investment risk in projects, but the conditions for that risk reduction are limited. A helping hand from the state can easily change to a hindering hand.

7.2. Implications for Research, Practice, and Public Policy

These findings matter for research in management and related fields. They extend a stream of research we started a dozen years ago. That stream began with a broader study suggesting that

ownership composition was a significant and substantial determinant of investment risk in projects (Vaaler *et al.*, 2008). It then ran more directly at understanding conditions when state ownership enhanced or detracted from organizational performance, whether that be privatizing telecoms (Vaaler & Schrage, 2009) or power projects with state ownership (James & Vaaler, 2013). That research laid the foundation for the two-factor theoretical framework developed in this study and other recent work (James & Vaaler, 2018). These two studies demonstrate that the combination of low host-country policy stability and minority state ownership reduces investment risk when projects are first announced (James & Vaaler, 2018) and when they move to the next financing stage.

These findings matter for other recent research on the performance effects of partial state ownership. As we noted earlier, Musacchio and colleagues (Inoue *et al.*, 2013; Musacchio & Lazzarini, 2014; Musacchio *et al.*, 2015; Wright *et al.*, 2021) have also theorized that minority state ownership in enterprises conveys advantages, but their advantages relate more to favorable state intervention, insurance and access rather than state assurance of non-intervention. Illustrative examples for their proposal come from developing countries, but they set no explicit limits on country context. We do. When country context shifts from developing countries with lower policy stability to wealthy, well-established democracies with higher policy stability, we no longer hold that substantial but non-controlling minority state ownership will deliver the risk-reducing effects documented in our study. Indeed, we propose the opposite effect. When host countries do not face the institutional challenge Ramamurti (2003) described, then partial state ownership is a superfluous additional assurance. Indeed, it is potentially interfering with prudent project governance. Potential lenders are more likely to delay financing commitments if not withdraw irrevocably.

Our study also has implications for organizational research methods measuring and analyzing investment risk. Researchers tend to study investment risk in the context of large, well established, MNEs with subsidiaries operating in several countries (*e.g.*, Zaheer 1995). Our study suggests a

different context. We use single-business projects and exploit their distinctive experiences at different stages of their development. When Esty (2004) poses the rhetorical question about why we should study large projects, a substantial part of the answer relates to the greater transparency and increasing frequency of projects as a preferred foreign direct investment mode, particularly in developing countries. The future of empirical research on investment risk almost certainly includes a larger role for projects in broad-sample statistical studies like ours and in more detailed case studies of individual projects and their risk management practices (*e.g.*, Sawant 2010b).

Implications extend to project executives and state policymakers. We documented the investment risk-diminishing effects of minority state ownership in projects located in host countries with low policy stability, and repeatedly suggested a “substantial but non-controlling” level of minority state ownership. In previous research, that level hovered in the 20-30 percent range (James & Vaaler, 2013, 2018; Vaaler & Schrage, 2009). This same minority state ownership range provides a useful starting point for project investors, executives, and politicians discussing alternative ownership structures meant to advance project development from initial announcement, to financing, construction, and operation without undue delay.

Our findings may enthrall developing-country policy analysts. They may be more inclined to use scarce public money to take minority equity stakes in projects that they think will contribute to broader economic development. We think that enthusiasm justified, but we also counsel caution. Minority state ownership might reduce investment risk and speed project development, but those benefits can tie up millions of dollars that could go elsewhere. As Wells (2014) notes, those same policy analysts might gain as much, if not more, by using those dollars to train, pay, and provide more resources to judges and regulators as part of a broader policy building institutional capacity.

So does this mean that partial state ownership has only a temporary place in developing- and no place in developed-country settings? We think not. Figure 9 depicts the geographic distribution of

more than US\$50 billion in projects for wind, solar, biomass, and other renewable energy projects announced from 2000-2010. Developing countries like Brazil, India, and China comprise several billion, but the locus of renewable energy projects is in developed countries in Western Europe, Canada, and Australia. State ownership in these projects varies with little or none in Canada, but states are owners in more than a third of all renewable energy projects announced in Australia. Given our theoretical framework, state ownership makes little sense. Given well-settled legal and regulatory arrangements there and elsewhere in most industrialized democracies, even minority state ownership provides, at best, a superfluous additional guarantee of general policy stability.

-----Insert Figure 9 approximately here-----

But we think the purpose of state ownership in these renewable energy projects in developed countries serves another purpose. It signals state support for specific policy goals often set when specific legal and regulatory standards are still emergent from well-funded and legitimate standards-setting bodies: legislatures, regulatory agencies, courts. In this context, state ownership in renewable energy projects is an interim strategy to assure private investors and speed the diffusion of “green” energy technologies as a consensus develops regarding which technology standards to support. As Marcus and Malen (2018) point out, partial state ownership is one of many techniques for speedier diffusion of renewable energy as a response to fossil fuel dependence and the ravages of climate change.

7.3. Limitations and Future Research

Like any study, ours has limitations. We developed and tested theory about the investment risk effects of minority state ownership for projects in host countries where policy stability is low. Ownership represents but one means for states to participate in projects. There are other modes to consider. States may loan or guarantee loans to projects. They may also set favorable tax rates and duties on goods that projects import for construction and operation. Dorobantu and colleagues (2019,

forthcoming) suggest a promising avenue for future research focusing on state participation in bank syndicates lending to projects. This context provides an opportunity to understand how substantial but non-controlling participation in these syndicates matters for subsequent construction and operations in project development. Future research will benefit from scrutiny of these alternative sources of state support and the signal they send to project stakeholders.

We investigated the impact of state ownership on investment risk for projects in states with low policy stability but we did not delve deeply into sources of that low policy stability. Change in policies relevant to investors and prospective lenders could follow elections changing governments and policy priorities (Vaaler, 2008). Changes could also follow from extra-constitutional coups (Fosu, 2002).

Future research could also investigate how state ownership matters differently depending on which state faction does the project investing. Hiatt and colleagues (2018) suggest that investments from military branches of the state provide stronger long-term assurances to private investors and potential lenders, particularly when projects have dual civilian and military uses such as with air transport projects. States are anything but monolithic. To advance research on state ownership in projects and other enterprises, we should decompose the state construct into the myriad constituencies it represents.

Our theoretical framework assumed that state ownership meant *host*-country state ownership, but state investors from project sponsor *home* countries might also matter for project survival and success. For many IB and public policy experts in this field, projects located around the world with Chinese state ownership present an apt context for evaluating our conjecture. The 2000s saw the commencement and then enunciation of a so-called “belt and road” policy in China mandating state investment and a voice in projects in developing countries deemed important to China’s foreign trade, foreign relations, and domestic economic development policy priorities (Chatzky & McBride, 2020).

The implication for our conjecture is that Chinese investment should lower project risk to signal support serving both commercial and broader policy objections.

-----Insert Figure 10 approximately here-----

We see just the opposite trend in data from the 2000s summarized in two bar charts depicted in Figure 10. As we noted earlier in this chapter, one indication of higher risk in a project is delayed financing after initial announcement. Another is a higher percentage of equity proposed to fund the same project at initial announcement but before actual financing is arranged. 72 projects with Chinese sponsors announced in the 2000-2010 period had an average equity percentage of approximately 22. That same decade saw more than 3,000 projects without Chinese sponsors. Their average equity percentage was approximately 15, significantly lower and, thus, less risky. Interestingly, the 72 “Chinese” projects have mean characteristics quite similar to the “non-Chinese” ones: similar mean project cost, host-country sovereign rating, *etc.* The mix of host countries for the Chinese projects overlaps substantially with the non-Chinese projects.

Our preliminary insight is that Chinese state investment in projects abroad may signal political interference with rather than support for commercial operations. Of course, that preliminary insight awaits further study with more data, more closely-matched samples, and more nuanced analytical methods. This chapter provides apt students with guidance for that study and others demonstrating how state ownership matters for project survival and success in the 2020s and beyond.

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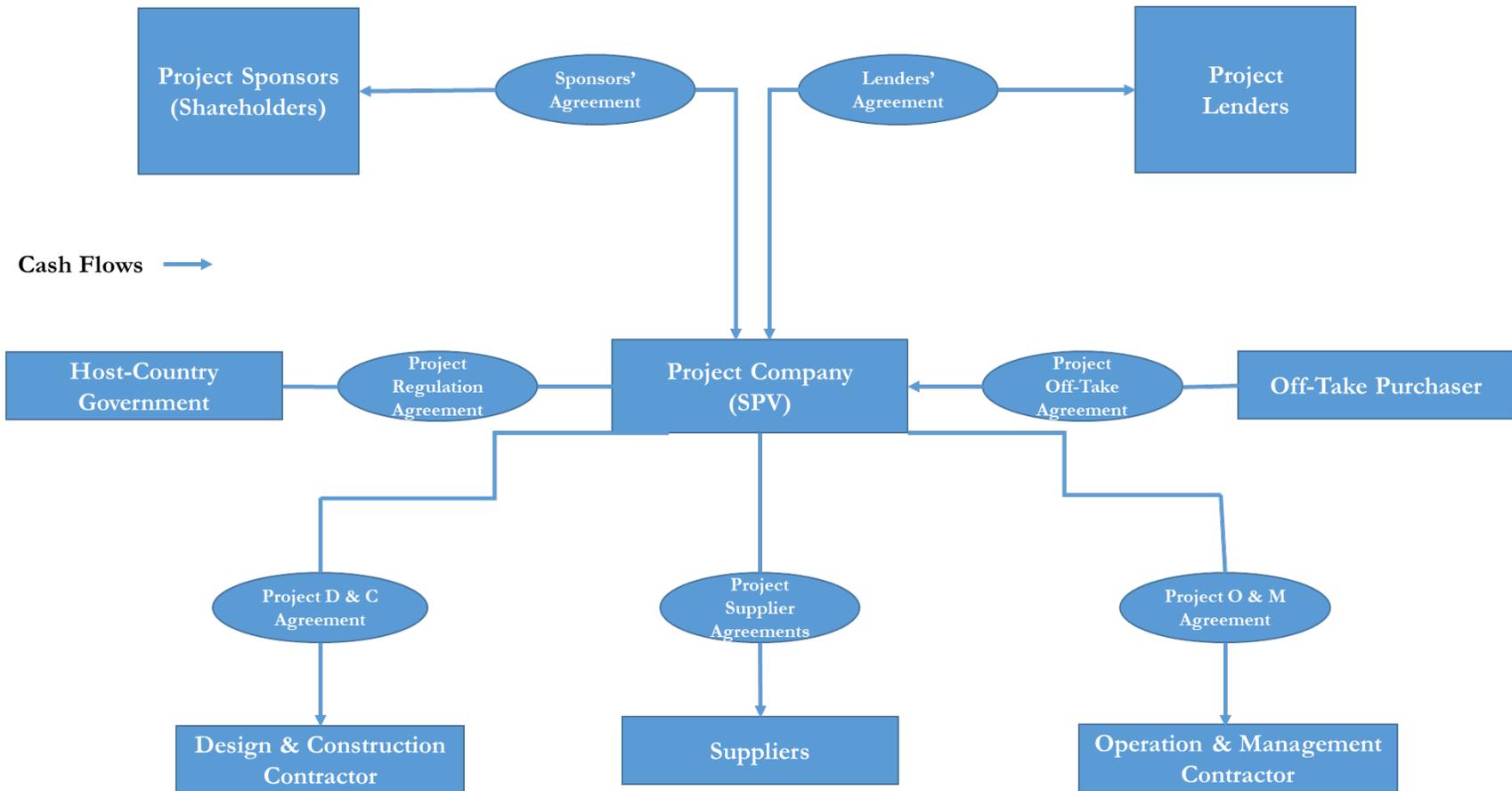
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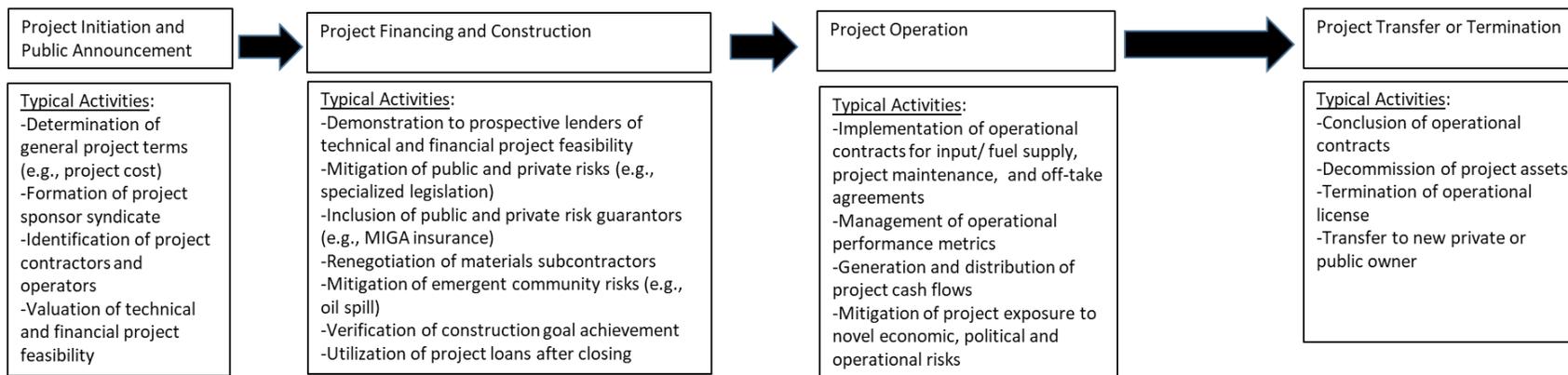
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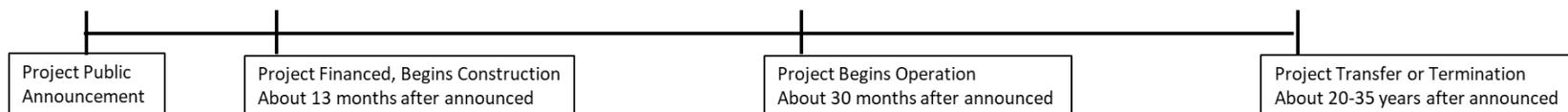
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Activities of Project Stages:



Timeline of Project Stages:



Examples of State Ownership and Project Financing Speed:

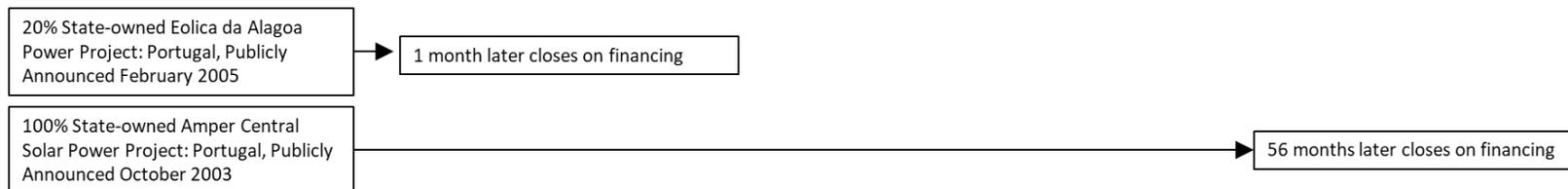
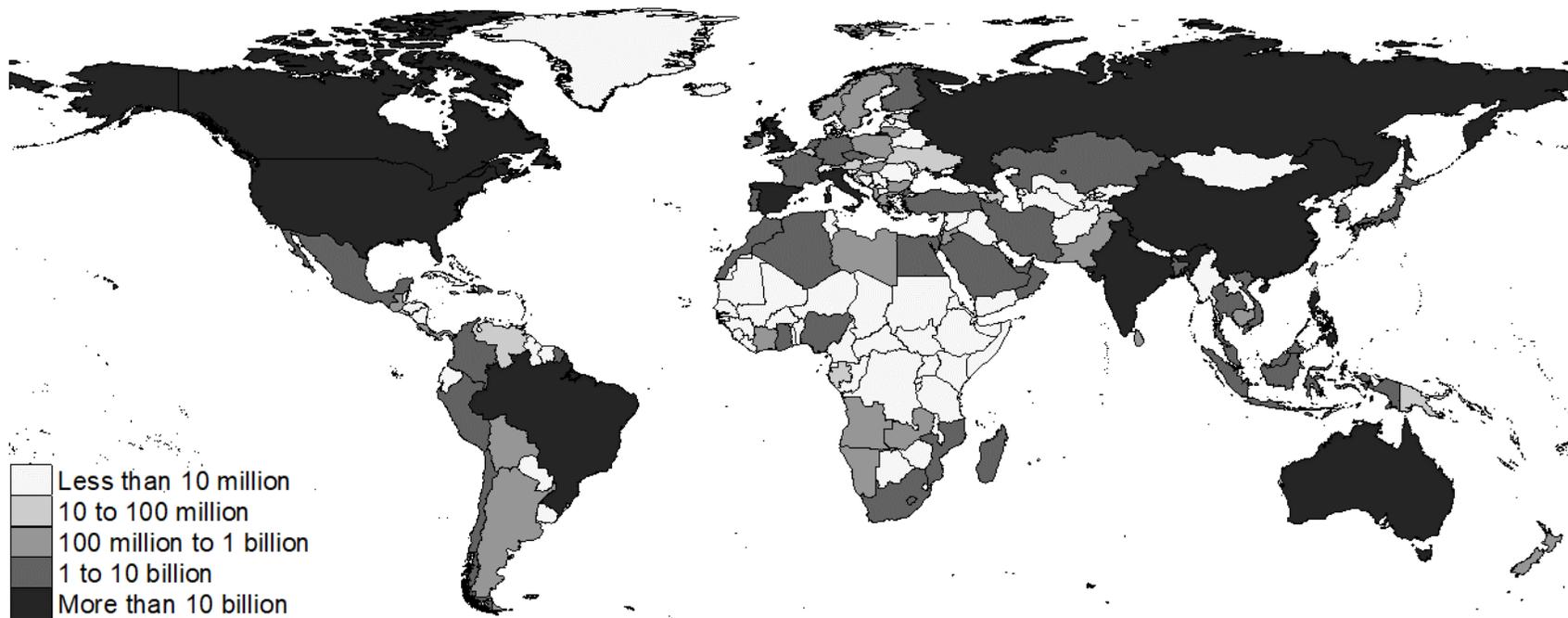
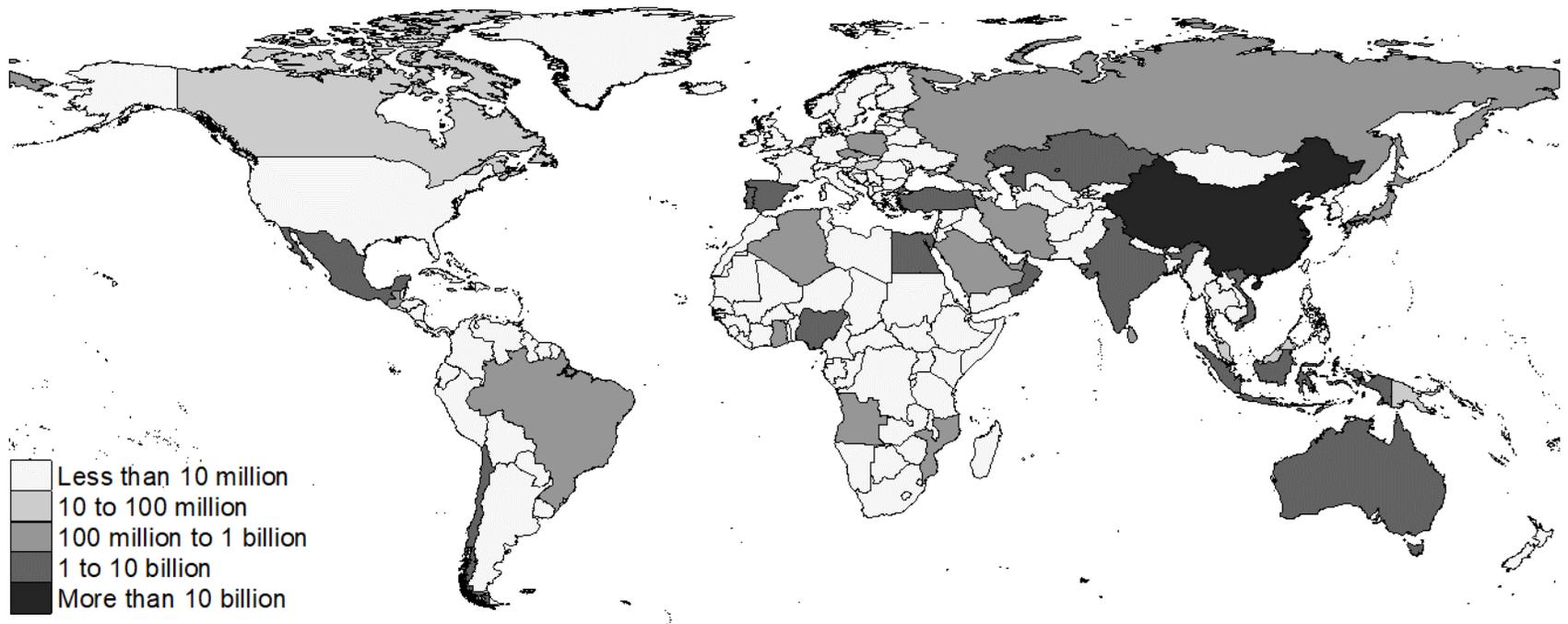


Figure 2: Typical project development stages, agreements, and timeline.





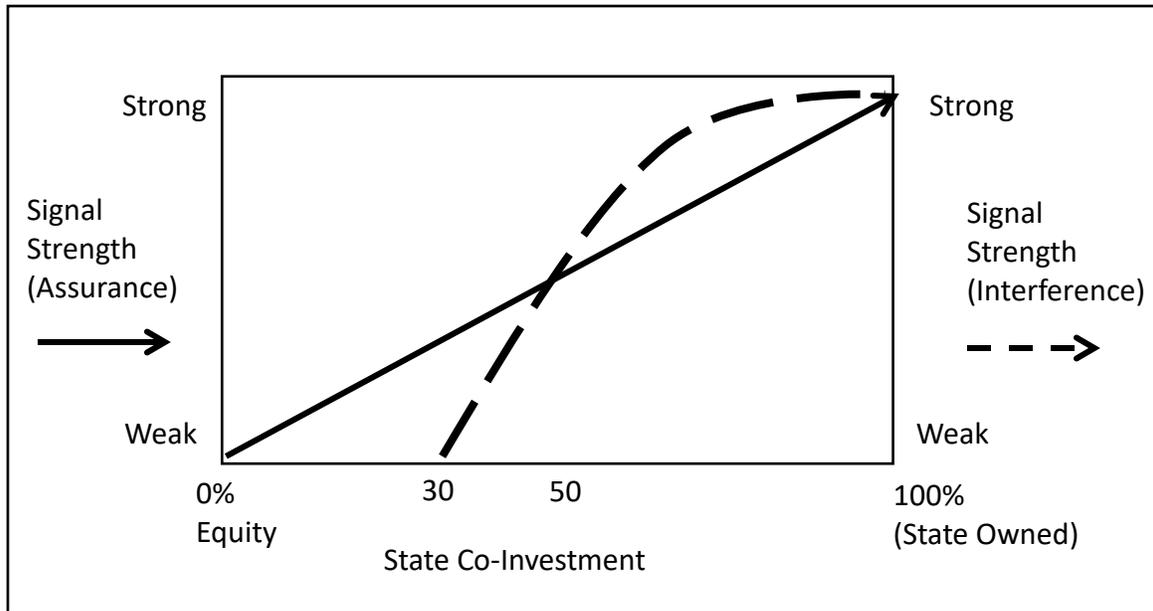
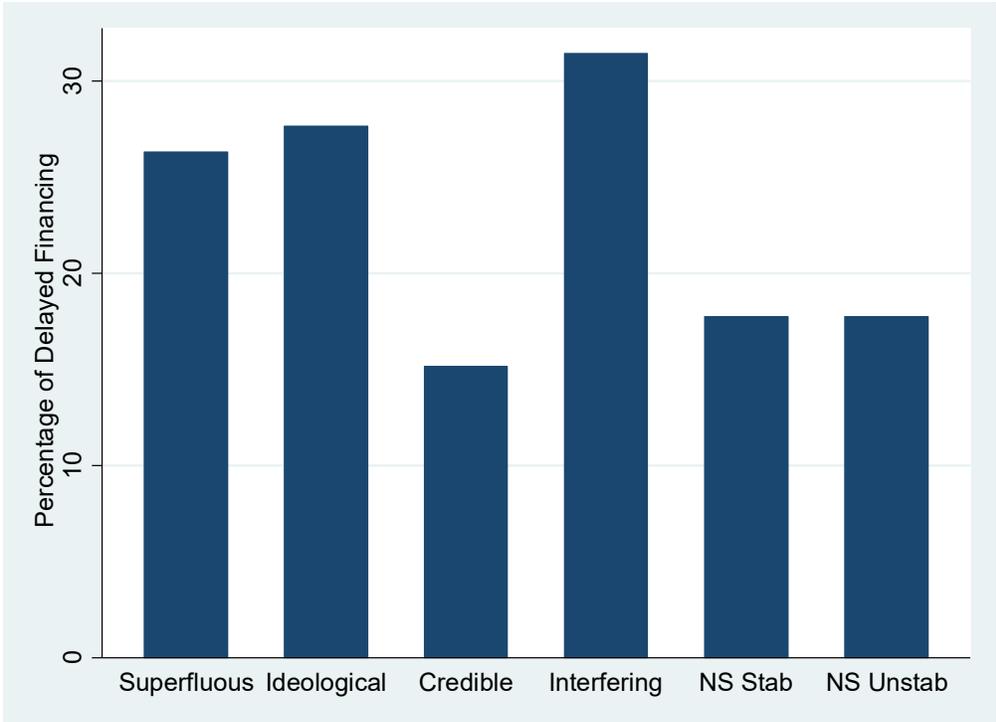


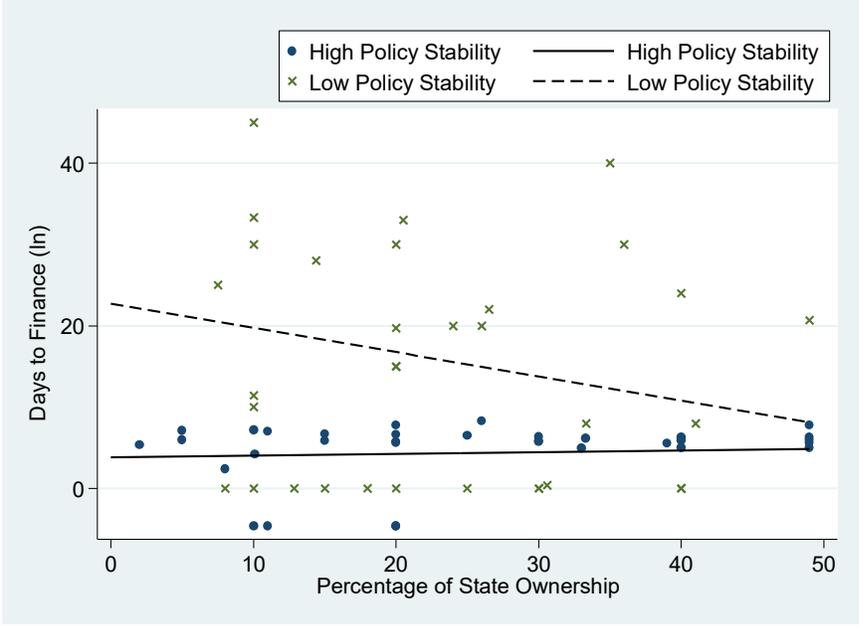
Figure 4. Signals of assurance and interference for increasing state ownership in countries where policy stability is low.

Policy Stability	High	<p><u>1. Superfluous State Ownership</u></p> <ul style="list-style-type: none"> •Future State Regulation More Likely to Support Initial Project Investment Terms. •State Ownership Provides Some Alternative But Unnecessary Additional Assurance of Support. •State Ownership Is Non -Controlling: Less Likely to Interfere Under Initial Project Investment Terms. 	<p><u>2. Ideological State Ownership</u></p> <ul style="list-style-type: none"> •Future State Regulation More Likely to Support Initial Project Investment Terms. •State Ownership Provides More Alternative But Unnecessary Additional Assurance of Support. •State Ownership Is Controlling: More Likely to Interfere Under Initial Project Investment Terms.
	Low	<p><u>3. Credible State Ownership</u></p> <ul style="list-style-type: none"> •Future State Regulation Less Likely to Support Initial Project Investment Terms. •State Ownership Provides Some Alternative Assurance of Support. •State Ownership Is Non -Controlling: Less Likely to Interfere Under Initial Project Investment Terms. 	<p><u>4. Interfering State Ownership</u></p> <ul style="list-style-type: none"> •Future State Regulation Less Likely to Support Initial Project Investment Terms •State Ownership Provides More Alternative Assurance of Support •State Ownership Is Controlling: More Likely to Interfere Under Initial Project Investment Terms
		Minority	Majority
		State Ownership	

Figure 5. Four scenarios (e.g., Credible State Ownership) based on whether there is minority or majority state ownership in a project (x-axis) and whether there is low or high host-country policy stability (y-axis).



based on state ownership and host-country policy stability: Superfluous, Ideological, Credible, and Interfering State Ownership; and NS Stab (no state ownership and above sample mean policy stability), NS Unstab (no state ownership and below sample mean policy stability).



(x-axis) and days (logged) from initial project announcement to financing (y-axis) for 153 projects with some state ownership, 1990-2007. The solid trend line (●) runs through projects in host countries with high policy stability. The dotted trend line (x) runs through projects in host countries with low policy stability.

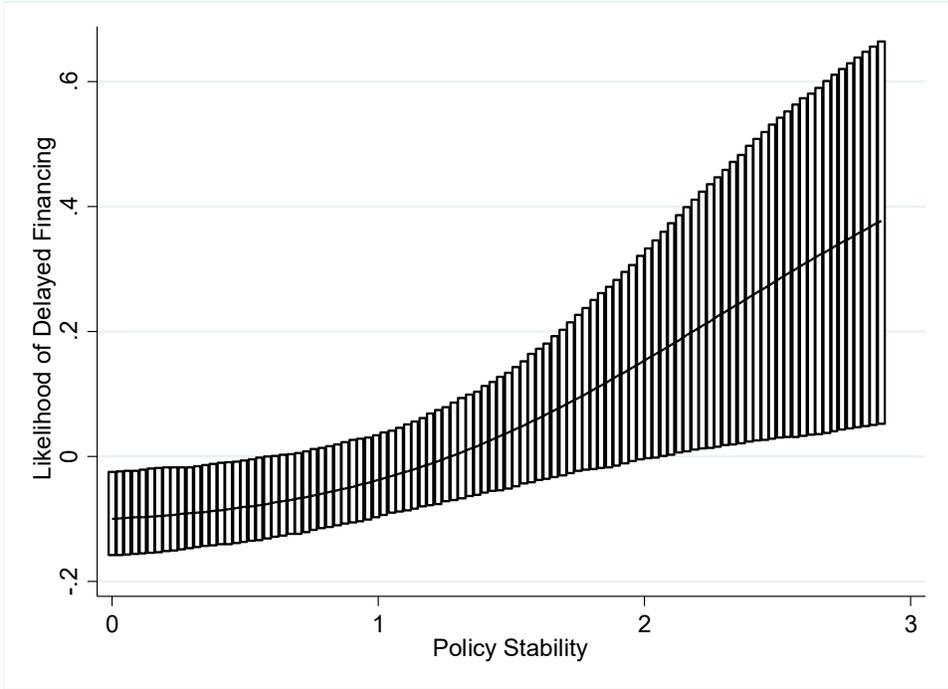


Figure 8. Impact of increasing host-country policy stability on likelihood of delayed financing

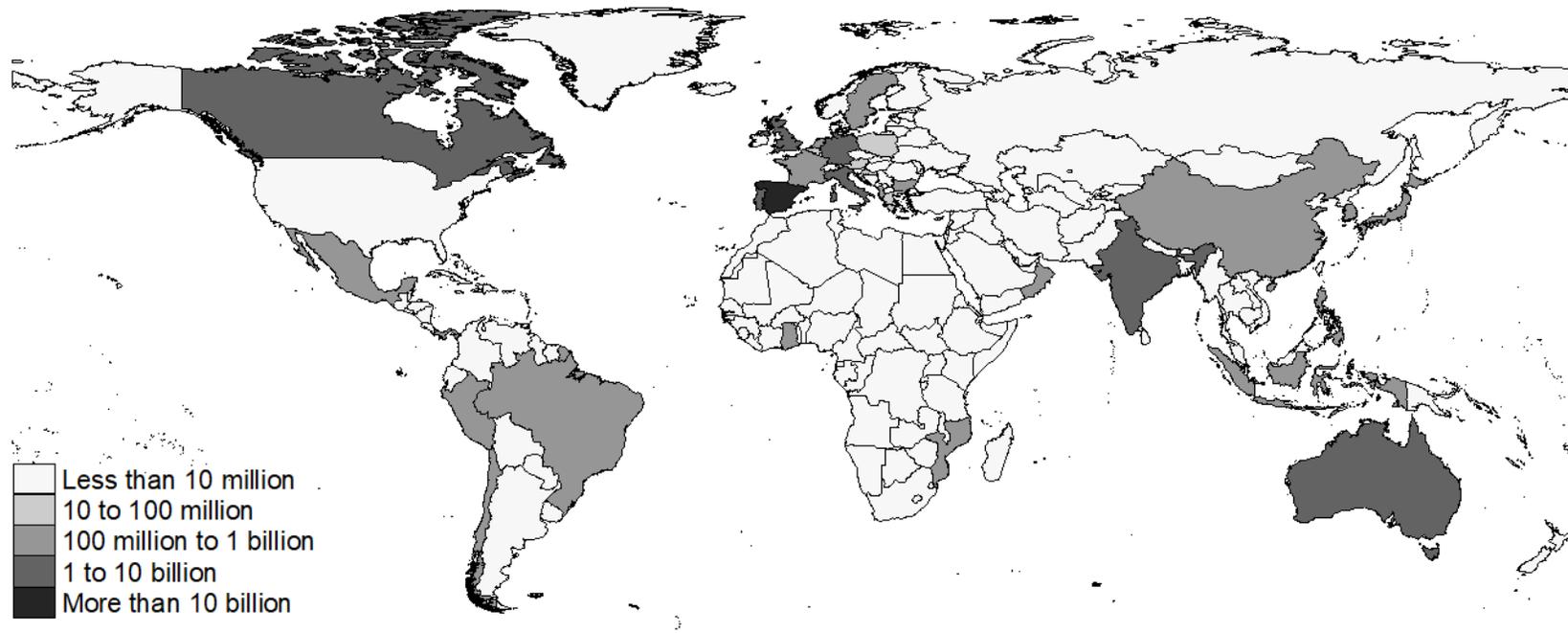


Figure 9. Announced value (in US\$) of all project financed-based investments in the renewable energy sector, 2000-2010.

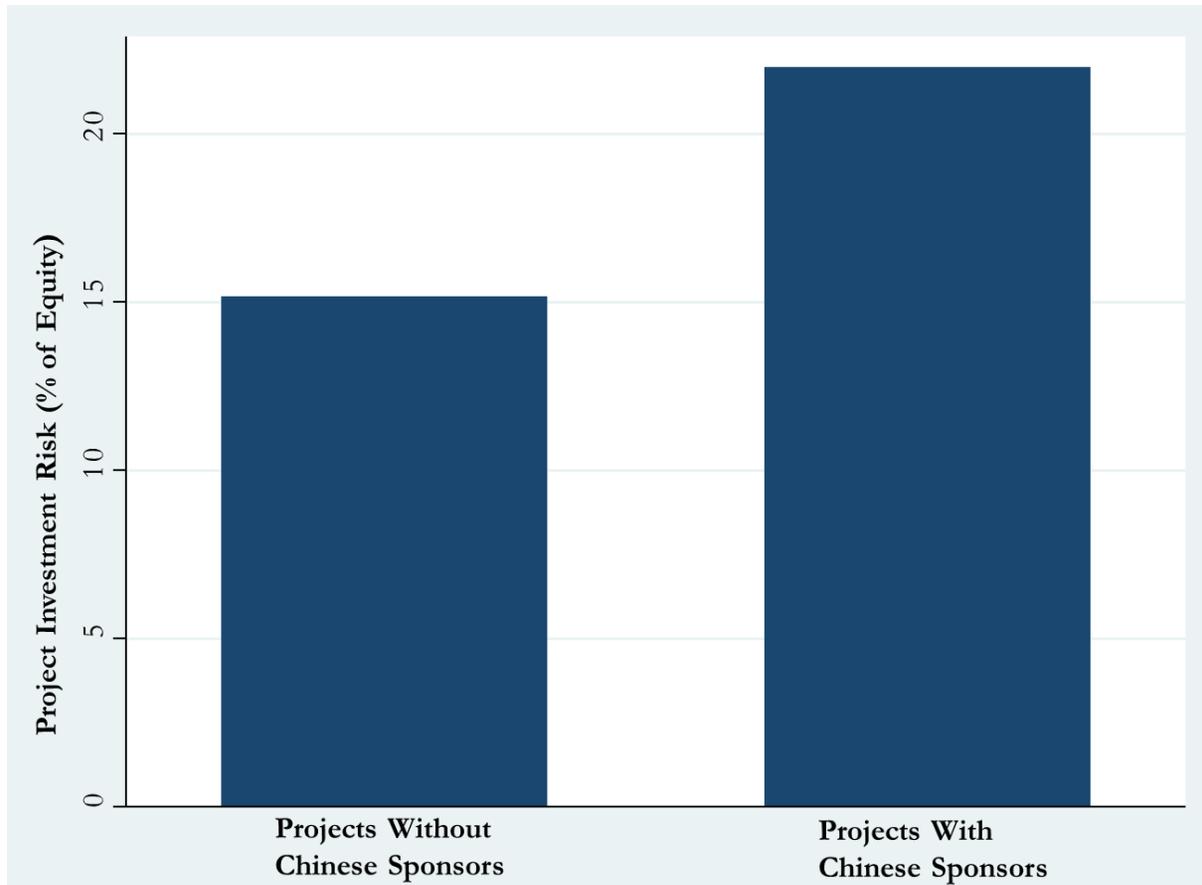


Figure 10. Investment risk for announced projects with and without Chinese sponsors, 2000-2010.

Table 1: Financing and operational differences between project- and corporate-based investments

Dimension	Corporate-Financed Investments	Project-Financed Investments
Type of Capital	Permanent –an indefinite time horizon for equity.	Finite –time horizon of equity matches project life-span.
Dividend Policy and Reinvestment Policy	Corporate management has discretion to pay dividends or reinvest earnings.	Project management has obligation to pay fixed dividends with or no earnings reinvestment.
Capital Investment Decisions	Reported on consolidated corporate accounting documents. Largely opaque to creditors.	Reported on single-business project company accounting documents. Largely transparent to creditors.
Transaction Costs for Financing	Lower costs for routinized equity and debt transactions including conventional lenders.	Higher costs for specialized project transactions including specialized lenders.
Basis for Credit Evaluation	Overall health of corporation; focus on quality of corporate cash flows and balance sheet assets.	Project technical and economic feasibility; focus on project cash flows, assets, contractual agreements.
Debt and Equity Needs	Lower ratios indicative of greater reliance on equity funding	Higher ratios indicative of greater reliance on debt funding.
Employee and Contractor Personnel Mix	Greater reliance on corporate employees and internal capabilities to operate projects.	Greater reliance on outside contractors and suppliers to operate projects.

Table 2. Variable names and descriptions, data sources, descriptive statistics, and expected impact on delayed financing, 1990–2007^a

Variable Name	Variable Description and Data Sources	Descriptive Statistics	Expected Impact on <i>Delayed Financing</i>
<i>Delayed Financing</i>	0-1 indicator that equals one when days from initial project announcement date to financing date exceed the sample mean (453) by more than one standard deviation (634). Source: SDC (2013)	Mean = 0.19 Min = 0 SD = 0.39 Max = 1	Dependent Variable
<i>Project Size</i>	Natural log of the total investment project cost in millions of US dollars. Source: SDC (2013)	Mean = 5.58 Min = 1.36 SD = 1.33 Max = 9.22	Positive
<i>Syndicate Ownership</i>	Herfindahl index of equity stakes by all investment project sponsors. Higher scores indicate greater concentration of ownership and fewer sponsors. Source: SDC (2013)	Mean = 0.75 Min = 0.13 SD = 0.28 Max = 1	Negative
<i>Percent Domestic</i>	Percentage of project equity ownership held by individuals in the same country where the investment project is located. Source: SDC (2013)	Mean = 57.47 Min = 0 SD = 43.22 Max = 100	Negative
<i>Offtake Contract</i>	0-1 indicator that equals one if there is a specified buyer (“off-take”) contract associated with the investment project whereby the buyer agrees to purchase the project output at preset prices and quantities. Source: SDC (2013)	Mean = 0.36 Min = 0 SD = 0.48 Max = 1	Negative
<i>Project Bid</i>	0-1 indicator that equals one if the state solicited a bid for the investment project. Source: SDC (2013)	Mean = 0.13 Min = 0 SD = 0.33 Max = 1	Negative
<i>Lead Sponsor Experience</i>	Number of previous investment projects in the same host country and industry where the lead sponsor was a project owner. Source: SDC (2013)	Mean = 1.10 Min = 0 SD = 3.64 Max = 46	Negative
<i>Industry Demand</i>	Aggregate standardized score of industry demand for investment projects in host country. ^b	Mean = 0.00 Min = -10.66 SD = 0.99 Max = 17.58	Negative
<i>Country Rating</i>	Annual average sovereign ceiling rating by Moody's, S&P, Fitch, Duff Credit Rating, Thomson Bank Watch and Investment Bank Credit Analysis of long-term foreign currency-denominated debt converted to a 0-16 scale (AAA = 16, AA+ = 15, ...B- = 1, Below B- (Default) or No Rating = 0). Source: Bloomberg (2020).	Mean = 10.80 Min = 0 SD = 5.29 Max = 16	Negative
<i>Policy Stability</i>	Natural log of 1-18 “checks and balances” score (1= no/minimal checks to 18 = substantial checks on political authority) assessing the number of relevant policy veto holders in national polity. Source: World Bank's DPI (Beck <i>et al.</i> 2001)	Mean = 1.32 Min = 0 SD = 0.62 Max = 2.89	Negative
<i>Minority State Ownership</i>	0-1 indicator that equals one if the state owns greater than 0% and less than 50% of an investment project. Source: SDC (2013)	Mean = 0.06 Min = 0 SD = 0.23 Max = 1	Negative conditional on <i>Policy Stability</i> (see Hypothesis 1)
<i>Superfluous State Ownership</i>	0-1 indicator that equals one (and zero otherwise) if policy stability is above the sample average (<i>i.e.</i> , > 1.32) and state ownership is less than 50%. Source: SDC (2013)	Mean = 0.02 Min = 0 SD = 0.15 Max = 1	Positive relative to <i>Credible State Ownership</i> (Hypothesis 2)
<i>Ideological State Ownership</i>	0-1 indicator that equals one (and zero otherwise) if policy stability is above its sample average (<i>i.e.</i> , > 1.32) and state ownership is equal to or greater than 50%. Source: SDC (2013)	Mean = 0.03 Min = 0 SD = 0.18 Max = 1	Positive relative to <i>Credible State Ownership</i> (Hypothesis 2)
<i>Interfering State Ownership</i>	0-1 indicator that equals one (and zero otherwise) if policy stability is below its sample average (<i>i.e.</i> , < 1.32) and state ownership is equal to or greater than 50%. Source: SDC (2013)	Mean = 0.02 Min = 0 SD = 0.14 Max = 1	Positive relative to <i>Credible State Ownership</i> (Hypothesis 2)

a. Table 2 presents data sources and sampling characteristics, descriptive statistics and hypothesized relationships for primary dependent, control, and explanatory variables used empirical analyses. Estimated models also include 0-1 year indicators (dummies) for 21 of 22 years and five of six industries represented in analyzed samples.

b. *Industry Demand* is a standardized (Mean = 0, SD = 1) industry measure for host countries assessed in the year of an investment project announcement. For a project in the mining industry, the standardized value is based on the dollar value of all country ores and metals exports as a percentage of all merchandise exports (WDI 2020) multiplied by the average annual world commodity metals price index value (Index Mundi 2020). For a project in the oil and gas industry, the standardized value is based on the dollar value of country fuel exports as a percentage of all merchandise exports (WDI 2020) multiplied by the inflation adjusted annual average crude oil price in the US (InflationData.com 2020). For a project in the water and sewage or in the waste and recycling industries, the standardized value is based on the percentage of a country's population without “improved” residential water source divided by the natural log of GDP (WDI 2020). For a project in the power generation and transmission industry, the standardized value is based on country per capita growth in electricity consumption divided by the natural log of GDP (WDI 2020). For a project in the telecommunications industry, the standardized value is based on country per capita growth in mobile cellular subscriptions divided by the natural log of GDP (WDI 2020). Higher standardized values imply greater demand for projects in that industry leading to lower investment risk for a given project in that industry.

Table 3. Results from regression analysis of delayed financing on policy stability, state ownership, and related variables, 1990-2007^a

Equation Independent Variables	Equation Estimator and Range of State Ownership									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Heckprobit 2 nd Stage
	0-100%	0-100%	0-100%	0-100%	1-100%	1-100%	0-100%	0-49%	0-49%	0-100%
<i>Project Size</i> (γ_1)	0.20*** (0.040)	0.20*** (0.040)	0.21*** (0.039)	0.21*** (0.040)	0.38*** (0.111)	0.37*** (0.110)	0.20*** (0.040)	0.19*** (0.042)	0.19*** (0.041)	0.30*** (0.090)
<i>Syndicate Ownership</i> (γ_2)	0.10 (0.183)	0.09 (0.188)	0.06 (0.194)	0.07 (0.195)	-0.21 (0.488)	-0.21 (0.495)	0.12 (0.194)	0.07 (0.211)	0.02 (0.203)	-1.43*** (0.375)
<i>Percent Domestic</i> (γ_3)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.004)	-0.00 (0.004)	-0.00 (0.001)	-0.00 (0.001)	-0.00 (0.001)	0.01*** (0.003)
<i>Offtake Contract</i> (γ_4)	-0.13 (0.106)	-0.11 (0.111)	-0.12 (0.108)	-0.13 (0.107)	-0.06 (0.234)	-0.06 (0.236)	-0.02 (0.108)	-0.12 (0.111)	-0.10 (0.112)	-0.23 (0.169)
<i>Project Bid</i> (γ_5)	0.29*** (0.109)	0.29*** (0.108)	0.29*** (0.110)	0.30*** (0.109)	0.17 (0.332)	0.15 (0.338)	0.30*** (0.106)	0.27** (0.109)	0.28** (0.108)	0.22 (0.240)
<i>Lead Sponsor Experience</i> (γ_6)	-0.00 (0.021)	-0.01 (0.021)	-0.00 (0.021)	-0.00 (0.021)	0.03 (0.033)	0.03 (0.036)	-0.01 (0.021)	-0.02 (0.019)	-0.02 (0.019)	0.05** (0.026)
<i>Industry Demand</i> (χ_1)	0.03 (0.044)	0.03 (0.043)	0.04 (0.044)	0.03 (0.043)	0.09 (0.058)	0.12* (0.055)	0.04 (0.044)	0.03 (0.044)	0.04 (0.045)	0.09 (0.059)
<i>Country Rating</i> (δ_2)	-0.04*** (0.012)	-0.04*** (0.012)	-0.04*** (0.012)	-0.04*** (0.012)	-0.00 (0.023)	-0.00 (0.026)	-0.04*** (0.013)	-0.04*** (0.012)	-0.04*** (0.012)	-0.05** (0.020)
<i>Policy Stability</i> (β_1)		0.11 (0.076)	0.10 (0.073)	0.06 (0.076)	-0.17 (0.268)			0.10 (0.087)	0.11 (0.085)	-0.25 (0.183)
<i>Percent State Ownership</i> (β_{2A})		0.00 (0.002)							-0.03*** (0.013)	
<i>Minority State Ownership</i> (β_2)			-0.08 (0.165)	-0.78** (0.337)	-1.23* (0.713)			-0.73** (0.330)		-1.06** (0.493)
<i>Minority State Ownership*Policy Stability</i> (β_3)				0.58*** (0.206)	0.71 (0.439)			0.56*** (0.204)		0.57** (0.286)
<i>Superfluous State Ownership</i> (ϕ_1)						0.49 (0.381)	0.59* (0.362)			
<i>Ideological State Ownership Scenario</i> (ϕ_2)						0.56 (0.404)	0.66* (0.390)			
<i>Interfering State Ownership Scenario</i> (ϕ_3)						0.83* (0.453)	0.73** (0.364)			
<i>NS Stab Scenario</i> (ϕ_4)							0.42 (0.291)			
<i>NS No Stab Scenario</i> (ϕ_5)							0.31 (0.277)			
<i>Percent State Ownership*Policy Stability</i> (β_{3B})									0.02*** (0.006)	
Constant (α)	-1.71*** (0.330)	-1.86*** (0.333)	-1.80*** (0.334)	-1.75*** (0.332)	-2.39*** (0.863)	-3.22*** (0.775)	-2.08*** (0.367)	-1.74*** (0.346)	-1.69*** (0.344)	-2.41*** (0.727)
Obs (Pseudo R ²)	1190 (0.07)	1190 (0.07)	1190 (0.07)	1190 (0.07)	153 (0.16)	153 (0.17)	1190(0.07)	1108 (0.07)	1108 (0.07)	1190

a. Table 4 reports coefficients and robust standard errors (in parentheses) from probit and two-stage Heckprobit regression of delayed financing (*Delayed Financing*) on right hand-side variables in Equations 1 and 2. Probit refers to probability and unit estimation of the discrete (0-1) dependent variable, *Delayed Financing*, with clustering on host countries. Heckprobit refers to a two-stage probit-probit estimation where the dependent variable for the first-stage probit estimation is *State Ownership*, a 0-1 indicator variable taking the value of one when the state has any equity interest in an investment project. For identifying purposes, the first-stage probit estimation includes an additional variable, *Competitive Legislature*, whose estimated coefficient (standard error) is -0.48*** (0.235). *Delayed Financing* is the dependent variable for the second-stage probit estimation. *** = p < 0.01, ** = p < 0.05, * = p < 0.10.