



# Exploring the Financing Structure of China's Overseas Power Project Investments: A New Structural Financial Economics Perspective

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Electricity shortage has been a critical bottleneck that constrains economic development. Since the early 2000s, China has become an increasingly important finance provider in supporting power projects abroad. We observe diverse financing arrangements and involve a wide range of financiers including loans from development banks, state-owned commercial banks, private commercial banks, as well as equity investments from public investment funds and power companies. Yet little is known about what determines the different financing structures of China's overseas power projects. Drawing on a comprehensive project-level dataset, our paper aims to examine the determinants of this infrastructure financing structure.

Theoretically, we draw on insights from New Structural Financial Economics to derive hypotheses for empirical testing. New Structural Financial Economics is a subdiscipline of New Structural Economics (NSE) that studies the determinants and dynamics of economic structure. NSE aims to set out the third generation of development economics after World War II by drawing lessons from the first two generations of development economics (i.e., structuralism emphasizing heavy government intervention and neoliberalism prescribing free market). NSE takes factor endowment structures (i.e., what an economy at any specific time has, including labor, capital, and land) as the starting point of analysis to examine what an economy can potentially do well (i.e., latent comparative advantages) and what kinds of institutional arrangements (including financial institutions) can better serve the needs of production structure. From the perspective of New Structural Financial Economics, different power projects have distinct financing needs owing to differences in technology maturity, project size, and political risks of their host countries. Furthermore, different financial arrangements, such as equity financing versus debt financing, large banks versus small- and medium-sized banks, and national development banks versus commercial banks, have distinct comparative advantages in meeting the financing needs of power projects on the ground. Hence, it is of crucial importance to ensure that financing structures match financing needs to fill the financing gap.

Based on the rigorous econometric analysis and in-depth interviews with key financiers and stakeholders, we have arrived at the following key findings:

First, equity financing is likely to be deployed in renewable energy projects because their investment returns are often more uncertain or involve greater risks. Debt holders are often more risk-averse, as they expect repayment of their loans. By contrast, equity financing can enable finance providers to capture the upper side when high-risk projects turn out to be successful. The reason why investing in renewable energy projects may involve greater risks may be attributed to at least two factors. First, investing in renewable energy projects is often afflicted with more considerable policy uncertainty than in conventional fossil fuels. In-depth interviews with energy experts reveal that renewable energies often rely on government fiscal support, such as feed-in tariff, to make the investment economically feasible, especially at their early stage of development. Yet such policy support often suffers from uncertainties, which renders renewable energy investments riskier. Second, renewable energy technologies are relatively new. Even though more and more renewable energies have become technologically mature in recent years, it takes time to obtain the buy-in of new brands or

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products in overseas markets, especially when they enter foreign markets for the first time. Therefore, renewable energy projects are more likely to be matched with equity investments than conventional fossil fuel ones. By the same token, we also find that power projects in countries with lower levels of development are more likely to rely on equity financing as opposed to debt financing. Further interviews discover that the overall risks of investing in power projects in developing countries are often higher than those in developed countries. This may entail a greater reliance on equity investments.

Second, if the power generation projects are large in scale, they would probably receive debt financing from large banks. To maximize profits, large banks often prefer lending to big projects. No matter whether the project is large or small, it has gone through the full project appraisal, disbursement, and evaluation cycle. Thus, the per unit transaction cost of large projects is smaller than small ones. Even though large banks are able to finance small power projects, profit-driven large banks would be more willing to finance large projects. Furthermore, large banks often have a greater risk appetite than small banks due to their sheer size. If small banks punch above their weight to finance large banks to reap more profits, this would probably result in high concentration risks that may go beyond the risk appetite of small banks and even run contrary to the financial regulatory requirement.

Third, the participation of national development banks can mitigate the negative impact of political uncertainty on power generation project financing in the case of high political risks in host countries. Political risks in host countries may render infrastructure projects infeasible. Political risks encompass expropriation, the convertibility and transferability of currency, political violence, and unanticipated regulatory changes. Infrastructure projects are often long-term investments, which are vulnerable to political risks. National development banks are more likely to bear more risks than commercial banks, because they are steered by governments to achieve public policy objectives. As public policy instruments, national development banks are able to take more risks than private commercial banks, especially when power projects generate social, economic, and environmental benefits (such as job creation and carbon emission reduction) that are hard to be internalized by private banks. In addition, development banks are more likely to lead the way to finance green power projects to make the demonstration effects. Development banks are often better equipped with industrial expertise than commercial banks. Hence, they may be better able to anticipate the trend of industries and technologies and make pilot investments.

To conclude, our study systematically examines the determinants of financing structures of China's overseas power projects. We find that there are vast variations in financing needs across different power projects, which are matched with different financing arrangements. The policy implication is that financier need to tailor their financing arrangements to better meet the needs of distinct power projects to fill the financing gap.

*The views expressed in this Policy Brief are strictly those of the author(s) and do not represent the position of Institute of New Structural Economics at Peking University, or the organization(s) of the author(s).*

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