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# Financial constraints and firms' investment: results of a natural experiment measuring firm response to power interruption

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Financing constraints is an important research subject in the economic literature, which attempts to explain why firms do not undertake profit-maximizing investment, i.e. why they do not expand their capital stock if marginal return to capital is above the market interest rate. Credit constraints now figure prominently in macroeconomic analysis, and there is a strong evidence from cross-country regressions that underdeveloped financial systems are associated with poor investment and growth. Establishing evidence of credit constraints from micro-economic data is more difficult, because measuring the return to capital is complicated by unobserved factors such as entrepreneurial ability and demand shocks, which are likely to be correlated with capital stock.

This study uses the observed differences between public system failure and private investment as a natural experiment to reveal the effect of financing constraints on firms' ability to substitute specifically for deficient public services and more generally to acquired complementary capital, i.e. services necessary for the operation of productive private capital.

The analysis focuses on the natural experiment created by the firm's decision to invest in electric power generator to hedge against unreliable public power supply. The theoretical model predicts that financing constraints will reduce firm's expected return from the generator. Thus, holding other things constant, firms with better access to credit will be more likely to install the generator if the power outages are frequent.

The predictions of the theoretical model are then tested empirically on firm-level data from Sub-Saharan African countries. The results show that firms with better access to credit are more likely to own a private generator in the areas where public power supply is unreliable. Also, the firms are more likely to respond to the power outage shocks and privately install generators if they operate in the countries with more developed

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financial systems or during the periods of rapid domestic credit growth. Consistent with the predictions of the theoretical model, these findings suggest that financing constraints can significantly restrain firms' ability to find a replacement for a deficient public capital.

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