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The Economic Costs of Unsupplied Electricity: Evidence from Backup Generation among African Firms

EPRG Working Paper 1326

Cambridge Working Paper in Economics 1351

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Abstract Public electricity provision in Africa has been marred by under investment and frequent power outages. One of the strategies often adopted by firms to cope with this poor public supply is investment in backup generation. This strategy is not without cost however. Extant literatures on outage cost estimation have shown that firms possessing certain characteristics have a higher tendency to invest in backup generation. What is less known, however, is whether those firms suffer lesser or higher unmitigated outage losses (costs). Using cross-sectional data from 6854 firms currently operating in 12 African countries, this study investigated the extent to which firms' characteristics might create incentives for auto-generation and whether these incentives lead to lesser unmitigated outage costs. We used three different methods including marginal cost, incomplete backup and subjective evaluation techniques. The results reveal that large firms, firms engaging in exports, and those using the Internet for their operation still suffer higher unmitigated outage costs despite having a higher propensity of investing in backup generation. The results further reveal that unmitigated costs still account for the larger proportion of the total outage costs despite high prevalence of backup ownership among the firms. This reflects the inefficiency in backup generation due to small backup capacity held by firms. Our estimates also indicate that ignoring firms' characteristics such as size and the nature of operation (e.g. export promotion, internet usage, etc.) may result in underestimation of outage losses. The analysis further suggests that firms can still benefit significantly even when the current subsidised tariffs are replaced by cost-reflective rates that ensure stable electricity supply. The net outage cost (having adjusted for a cost-reflective tariff) incurred by firms are large enough to expand their scope of operation and hire more workers, suggesting the macroeconomic effect could be significant.

Keywords Africa, Backup, Electricity, Firms, Outage costs, Two-Limit Tobit

JEL Classification L6, L81, L94, N77, Q4

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Publication November 2013
Financial Support Cambridge Judge Business School Scholarship