

TOO BIG TO FAIL IN THE ELECTRICITY SECTOR

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Overview

The expression “too big to fail” became widely known after the 2008 financial crisis. It refers to the fact that the bankruptcy of some financial institutions could not be tolerated, as it would cause a collapse of the entire financial system. However, this phenomenon is not exclusive to the financial system. Other sectors have been confronted with this problem; examples include the Danish ambulance system and Railtrack in the UK. More generally, any sector, public or private, where the bankruptcy of a major player would have significant, immediate, detrimental consequences for the population is concerned. The consequences can be at a regional/national level, or worldwide.

Electricity is vital for our way of life. Blackouts are expensive for society and politically unacceptable. However, under current conditions (liberalised markets, significant penetration of renewables and highly interconnected markets), guaranteeing a reliable electricity supply has become a major challenge. Regulators are expected to ensure the well-functioning of the electricity markets, which implies, among other things, preventing market abuse and providing appropriate signals for investments. When regulators have failed to ensure the financial solvency of key players, this has led to expensive state interventions. Examples include the Californian crisis in 2001, the British nuclear case in 2002 and more recently Electricaribe, one of the largest retailers in Colombia.

However, the characteristics that classify a firm as “too big to fail” are far from clear, and are bound to vary across segments of the electricity supply chain, which includes generation, transmission, distribution and retail. Identifying these firms is important to enable monitoring them, and reacting to the first signs of problems, so as to avoid costly interventions later on. In this paper we identify the factors that make companies in the electricity sector critical to the system, and create a classification that can help regulators managing the risk. We discuss how regulation of these companies can be improved to avoid their failure. Due to space limitation, this abstract focusses on the first segment of the supply chain, generators.

Methods

Based on an extensive literature review, we identify the critical factors that can lead to the failure of an electricity generator. From this we derive a classification of key indicators to enable the regulator to identify the system-critical companies. Next we use this framework to develop case-studies of companies that have been bailed out by regulators or governments

Results

When should a generator in the electricity market be considered as “too big to fail”? The capacity margin is a key indicator of capacity adequacy which is critical for security of electricity supply (SoES). A first approach for evaluating the criticality of a generator consists of a direct comparison between its share of installed capacity and the capacity margin. A company with a capacity share close to the capacity margin will be considered critical, as its failure would endanger SoES. However, before deciding to declare a company critical, the role of a generator should be put into a wider perspective by considering the availability of substitutes. For instance, a country might be able to import significant volumes of electricity at short notice, at reasonable prices. This would require sufficient cross-border transmission capacity and neighbours with excess generation capacity, as is for instance the case between Finland (importer) and Russia (exporter) (Ochoa and Gore, 2015). Identifying system-critical companies is an ongoing, dynamic process, as a company can become more or less critical due to factors beyond its control. For instance, an increase in demand leads to a lower reserve margin, which increases the number of critical generators.

An important indicator is the medium- to long-term profitability of critical generators. Low profitability provides an early warning signal well before a company's financial viability is threatened. Indeed, a natural

reaction to decreasing profitability is an attempt to control costs, with preventive maintenance and technological upgrades often being one of the first victims of such cost-cutting exercises. This increases the likelihood of unscheduled down-time due to technical failure, a frequent cause of cascading blackouts (which is in itself often a result of missing upgrades to the grid). There are recent examples in Colombia where generators, which were paid to deliver certain volumes of firm energy were unable to deliver during a period of shortages (El Tiempo, 2015).

Hydro-storage plants deserve special attention. Their ability to generate depends not only on the technical availability of the turbines, but also on sufficient water inflows. Meteorological phenomena such as El Niño can result in apparently financially and technically sound plants suddenly being unable to generate, leading to electricity shortages and financial strain for the company. If such plants represent a significant share of the installed capacity, they are a treat to SoES, particularly in countries with a low capacity margin.

The criticality of generators is also influenced by factors beyond their control. For instance, limited grid adequacy or reliability can lead to grid congestion, transforming a small, seemingly non-essential producer into a key player. This was the case in the England and Wales market, where southern out-of-merit power plants were very often scheduled to generate due to constraints in the main north-south transmission grid (Newbery, 2013).

Conclusion

Each year many companies go bankrupt, mostly unnoticed by the general public. The situation is quite different when considering system-critical companies. The potential consequences for the population, and for the economy as a whole, of letting these companies go bankrupt forces the state to intervene. Considering the electricity sector, no government can quietly sit by while the lights go out. State-intervention can take different forms, ranging from subsidies, to bridge-loans while attempting to identify a buyer, or even nationalisation.

Such actions affect the other market participants. On the one hand, whatever the type of support, the government (and indirectly, the population) will end up paying part, if not all, of the bill. On the other hand, any form of subsidies to these ailing companies impacts the profitability of their competitors. More generally, such interventions create moral hazard problems, adversely affecting the confidence in the market and putting future investments at risk.

Whatever the implemented course of action, letting a system-critical company get to a stage where a governmental bail-out cannot be avoided results in a significant loss of welfare. “Too big to fail” companies should be identified, appropriately regulated and closely monitored. Possible actions include establishing early warnings concerning their profitability and debt level, and monitoring changes in the industry structure. The regulator must be able and willing to act promptly on information indicating potential risks. In other words, unlike what has been observed in the financial sector, regulation should be proactive rather than reactive.

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