



The Bigger the Better? Using Lotteries to Identify the Allocative Efficiency Effects of Firms Size

Paul Carrillo, Dave Donaldson, Dina Pomeranz, Monica Singhal

This study uses lotteries for public procurement contracts in Ecuador to understand the role that public procurement may play in fostering economic growth in developing economies. Our results indicate that public procurement may be used to infuse targeted sectors of domestic economies with new revenue streams, though this may not be sufficient for generating sustainable, long-term growth.

Research Motivation

“Resource misallocation”, i.e. the diversion of resources to inefficient uses, may hinder economic growth and productivity of both developed and developing countries. Factors such as state ownership of production plants, licensing, size restrictions and other regulatory framework are key determinants of misallocation (Hsieh and Klenow, 2009). Other sources of resource misallocation may be associated with the size of firms. Some examples include monopoly power, monopsony power, or collateral-based credit constraints. These mechanisms produce resource misallocations by creating barriers to growth for small firms and may contribute to the formation of “poverty traps”: self-defeating cycles where long-run firm growth is undermined by barriers external to the firm. Firms in developing countries may be particularly susceptible to poverty traps if input markets are inefficient.

This study investigates the role of public procurement in the distribution of national resources and promoting sustained growth in local businesses. Using administrative data from the Ecuadorian Tax Authority we assess the impact of public procurement on allocative efficiency (and overall performance) of small construction firms in Ecuador from 2009 to 2014. In particular, we draw on a novel policy in Ecuador that requires certain types of public procurement to be allocated through randomized lotteries, which generates random demand shocks to competing local firms. These temporary opportunities for firms to expand scale allow us to shed light on the question of whether these firms would appear to enjoy greater social efficiency if only they were to operate at a larger scale.

Procurement System

Like many developing nations, Ecuador has adopted policies to support the development of local business, including using its public procurement system to direct resources towards growing small and medium-sized firms (SMEs). After a significant overhaul in Ecuador’s public procurement legislation in 2009, public contracts for certain kinds of smaller construction projects - contracts for construction work below 0.0007% of the initial central government budget - are allocated to competing firms through a lottery system: among a set of qualified contractors who are willing to provide construction services at a fixed price, the winner is randomly chosen. This system minimizes the bureaucratic burden (and corruption concerns) of alternative assignment



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mechanisms. Such demand shocks allow firms to operate at a larger scale, at least in the short run.

The procurement lottery system has several appealing features that allow us to investigate the role of public procurement in the distribution of domestic resources. First, the lotteries are entered by a wide range of firms, from small to large. This context provides insight on how public procurement may promote growth within local businesses of various sizes. Second, contracts are randomly allocated amongst the qualified lottery participants, providing an exogenous demand shock that may be used to draw valid comparisons of winners to losers. Lastly, procurement lotteries accounted for 0.4% of GDP per year on average during the course of our study, which represents a meaningful portion of the Ecuadorian economy.

Data and Study Design

All lottery contracts, participants, and outcomes are publicly reported on SERCOP's website, which allowed us to collect detailed information regarding the contract value, duration, and involved parties through an automated scraping program. We then matched the participating parties to an administrative data set from the Ecuadorian Tax Authority to construct a database on the economic activity of all lottery participants. Besides annual corporate tax returns, we have access to monthly Value Added Tax (VAT) and employment records to track monthly firm activity and firm-to-firm transactions. This data allows us to track how the procurement lottery participants (18,474 lotteries with 9,393 distinct participants) respond to winning a contract relative to those firms that participated in the lottery and lost. This provides insight on how firms evolve when presented with a substantial growth opportunity.

Formally, we exploit the random demand shocks from the procurement lotteries to estimate a key structural coefficient that measures how restrictive an environment is to firm growth. Our identification strategy is similar to Doran et. al. (2016), where lottery outcomes are used to determine unexpected demand shocks that each firm is exposed to. We then assess the effect of the demand shocks on firm outcomes: self-reported and third-party reported sales, employment and material costs.

Results

Our results suggest that winning a contract allows firms to temporarily increase their scale (sales, material input purchases, and number of employees rapidly increase), but they are incapable of sustaining it in the long-run. Eventually, lottery winners return to their previous size. For example, Figure 1 shows the estimated impact of every \$1,000 in a lottery contract winnings on a firm's total sales during the 18 months subsequent to the lottery. As expected, sales increase rapidly as a direct result of the procurement contract, but they return to baseline levels within about 12 months. Winning a contract provides a short-term boost to firms' sales but does not lead to sustained long-term growth after the contract is completed. We also find that lottery winning does not crowd out (nor, crowd in) sales to other clients, be they in the public or private sectors.



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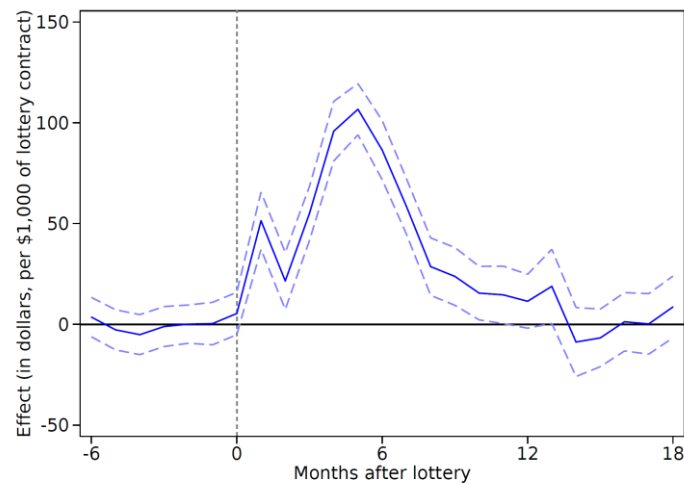


Figure 1: Impact of \$1,000 of lottery winnings on total sales

Policy Takeaways

Our results indicate that public procurement may serve as a viable tool for policymakers to direct additional revenues streams to local business. However, our results also indicate that this may not be sufficient to produce long-term sustainable growth as the burdens faced by firms in developing countries extend beyond limited demand.

Moving Forward...

This analysis shows the effectiveness of public procurement in infusing new revenue streams into growing sectors of developing economies. Targeted procurement may spark new economic activity, though this activity may not be sustained in the long-run. Further research is needed to identify other mechanisms that facilitate long-term growth.



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References

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