

# Preschool Education in Brazil: Does Public Supply Crowd Out Private Enrollment?

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**Summary.** — Expanding access to preschool education is a particularly important policy issue in developing countries, where enrollment rates are generally much lower, and where private institutions constitute a much larger share of the formal preschool sector, than in developed countries. This paper examines if an expansion in the supply of public preschool crowds-out private enrollment using rich data for municipalities in Brazil from 2000 to 2006, where federal transfers to local governments change discontinuously with given population thresholds. Results from a regression-discontinuity design reveal that larger federal transfers lead to a significant expansion of local public preschool services, but show no evidence of crowding-out of private enrollment, nor of negative impacts on the quality of private providers. This finding is consistent with a theory in which households differ in willingness-to-pay for preschool services, and private suppliers optimally adjust prices in response to an expansion of lower-quality, free-of-charge public supply. In the context of the model, the absence of crowding-out effects of more public preschool providers can be rationalized by the existence of relatively large differences in willingness-to-pay for preschool services across different demand segments. Our theoretical and empirical findings therefore suggest that in developing country settings characterized by relatively high income inequality, an expansion in public preschool supply will likely significantly increase enrollment among the poorest segments of society, and need not have adverse effects on the quantity or quality of local private supply.

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*Key words* — preschool education, private and public provision, crowding-out

## 1. INTRODUCTION

Public policies aimed at increasing access to formal preschool education are high on the political agenda in a number of countries. There are probably two main reasons for this. First, a higher supply of formal preschool education is by many seen as a crucial tool for achieving higher (female) participation rates in the labor market.<sup>1</sup> Second, there is now a sizable body of evidence for both developed and developing countries indicating that there are important long-term individual and public benefits to enrollment in preschool education (Almond & Currie, 2011; Behrman, Fernald, & Engle, 2013; Cunha, Heckman, & Lochner, 2006; Engle *et al.*, 2007, 2011).

Access to formal child care is a particularly important policy issue in developing countries, where enrollment rates are generally much lower, and where private institutions constitute a much larger share of the formal preschool sector, than in developed countries.<sup>2</sup> The generally low and uneven access to preschool education is arguably reflected in the observation of large disparities in cognitive development at the start of primary school in many developing countries. For example, Paxson and Schady, 2007 and Schady *et al.*, 2015 document a widening gap in cognitive development between poor and non-poor children in several Latin American nations.<sup>3</sup> After entering primary school, the gap tends to remain constant. Why do these gaps emerge and why do they stop growing? In light of the previously cited studies, a possible explanation lies in the differences in opportunities available—in particular, access to formal child care—to poor and non-poor children in their early years.

In order to remedy such problems, an available policy option is to increase the public supply of (free or widely affordable) preschool education. The intended effects of such a

policy are twofold: (i) to provide more equitable access and (ii) to increase the total supply of formal child care. However, the successfulness of such a policy depends crucially on the extent to which increased public supply crowds out existing private supply, which in turn depends on how private preschool providers respond strategically to increased competition from public providers. Do private providers respond by lowering their prices and competing more aggressively in all market segments? Or do they react by increasingly targeting higher-income households that do not find public providers attractive? If an expansion in free-of-charge public supply simply induces households to switch from high-quality private suppliers to lower-quality public centers, negative impacts on child development cannot be excluded.

In the present paper we analyze these questions empirically by examining the effect of changes in the supply of public child care services on private child care provision in Brazil. We use rich municipal-level panel data covering the period 2000–06 to analyze the effect of increased availability of public child care centers on the quantity of private supply, as measured by private enrollment rates and number of private centers. We also

\* We thank three anonymous referees for very helpful comments and suggestions. Odd Rune Straume acknowledges the financial support provided by the European Regional Development Fund (ERDF) through the Operational Program Factors of Competitiveness (COMPETE); and by national funds received through the Portuguese Foundation for Science and Technology (FCT) under the research grant PEst-C/EGE/UI3182/2013. Research for this paper has been supported in part by the World Bank's Multidonor Trust Fund for Trade and Development and through the Strategic Research Program on Economic Development. The views expressed herein are those of the authors only, and not those of the World Bank Group. Final revision accepted: October 2, 2015.

check whether increased public supply has any impact on the quality of private child care, as measured by group size, teacher qualification, and quality of infrastructure. To plausibly identify exogenous variation in public supply, we exploit unique features of the allocation mechanism of federal transfers to municipalities in Brazil, where the transfers received by local governments exhibit a non-linear and non-monotonic relationship with given population estimates. Results from a regression-discontinuity design reveal that larger federal transfers to a given municipality lead to a significant expansion of public preschool services (as measured by the number of municipal centers and enrollment), but show no evidence that such an expansion crowds-out private enrollment. If anything, the results suggest that private enrollment also increases. We also find no evidence of adverse effects on the quality of private provision.

To guide the interpretation of our empirical results, we develop a simple theoretical model of vertical differentiation, analyzing the optimal pricing response of a private child care provider to entry of a public competitor. In the model, public preschool education is free of charge (zero price), whereas private providers optimally set prices in a profit-maximizing way and supply higher-quality services. Demand for preschool services comes from two different segments of households, with consumers who differ in average income and therefore differ in willingness-to-pay for preschool education. The private provider optimally chooses between a high-price strategy, serving consumers with high willingness-to-pay only, and a low-price strategy, serving consumers from both segments. An expansion of public supply has ambiguous effects on private enrollment, depending on the difference in willingness-to-pay across consumer segments and on the relative size of each segment. Crowding-out effects of more public provision are less likely when the differences in willingness-to-pay across consumer segments are relatively large.

Our paper clearly relates to the more general literature on crowd-out effects of government funding, in particular the strand of the literature dealing with crowd-out effects of public provision of private goods. However, the existing empirical research has mainly been devoted to health care markets. [Cutler and Gruber \(1996\)](#) and [Gruber and Simon \(2008\)](#) analyze the extent to which public health insurance crowds out private insurance, while [Cohen, Freeborn, and McManus \(2013\)](#) study crowd-out effects of public providers in the US market for outpatient substance abuse treatment. In each case, sizable crowd-out effects are identified.

Among the relatively few empirical studies on child care markets in this strand of the literature, recent contributions include [Bassok, Fitzpatrick, and Loeb \(2014\)](#) and [Bassok, Miller, and Galdo \(2014\)](#), who find evidence of significant crowding-out of private providers as a result of increased public provision in the child care markets in Oklahoma and Florida, respectively. [Cascio and Schanzenbach \(2013\)](#) also find evidence of crowd-out effects from the expansion of public preschool in Oklahoma and Georgia, particularly for high-income families. Similarly, [Cascio \(2009\)](#) finds evidence of sizable crowd-out effects using US census data over five decades.<sup>4</sup> These mixed findings for the US and Brazilian settings can be rationalized in the context of our model. As noted above, crowding-out effects of more public provision are less likely when the differences in willingness-to-pay across consumer segments are relatively large. These differences are expected to be generally larger in the Brazilian context, where the levels of inequality in parental income are among the highest in the globe ([World Bank, 2004](#)).

While there is very little empirical literature on the response of private providers to increased public supply of child care, there exists a considerable literature on the effect of public (or subsidized) child care provision on maternal labor supply, which is a related but still distinctly different issue. Although the reported results from this strand of the literature are quite heterogeneous, most recent studies (applying quasi-experimental approaches) find that increased public financing of child care tends to crowd out existing child care provision, quantitatively ranging from moderate crowd-out effects (e.g., [Baker, Gruber, & Milligan, 2008](#)) to almost complete crowd-out with practically no effect on maternal labor supply (e.g., [Cascio, 2009](#); [Havnes & Mogstad, 2011](#)). However, these studies are not always able to distinguish whether public child care provision crowds out private provision of *formal* or *informal* child care. While this distinction is irrelevant for the question of maternal labor supply, it is of course crucial if the policy aim is to increase the total supply of formal child care in order to reap the long-term benefits of increased preschool attendance.

The rest of the paper is organized as follows. In the next section we provide information about the institutional characteristics that are important for the implementation of our empirical analysis, and provide a detailed description of the data. The empirical method and results are presented and discussed in Sections 3 and 4, respectively. In Section 5 we present a simple theoretical framework to guide the interpretation of our empirical results, where we relate the key model assumptions to the Brazilian reality. Finally, some concluding remarks are given in Section 6.

## 2. INSTITUTIONAL BACKGROUND AND DATA

This section describes the institutional setting underlying the empirical analysis and the data employed. We first outline the rules determining the allocation of federal transfers across Brazilian municipalities and describe the corresponding data. We then move on to describing the system governing the provision of formal preschool services, as well as the data on public and private preschool providers.

### (a) Federal transfers to municipal governments

Brazil has a highly decentralized system of government. Local governments receive large sums of public funds in the form of intergovernmental transfers, and are responsible for an important share of public goods provision, notably in the domain of education and culture, health and sanitation, social assistance, and local infrastructure.

A single federal fund—*Fundo de Participação dos Municípios* (FPM)—accounts for about 75% of all federal transfers and 40% of total municipal revenue. Established by the federal constitution, this fund consists of automatic federal transfers to municipal governments. At least 15% of total FPM transfers received by each municipality must be spent on education, 15% must be spent on health care, while the remaining is unrestricted.

The rules governing the allocation of FPM transfers across municipalities provide unique features for our empirical analysis. In particular, the amount of FPM funds transferred to each municipality in a given year depends on population size in a discontinuous way. As discussed in detail below, these discontinuities provide a useful source of exogenous variation in municipal funds available to local governments, part of which must be spent on municipal education.<sup>5</sup> While there is no

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