



# The threat of competition and public school performance: Evidence from Poland

Paweł Bukowski<sup>\*,a</sup>, Martyna Kobus<sup>b</sup>

<sup>a</sup> Centre for Economic Performance, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, United Kingdom

<sup>b</sup> Institute of Economics, Polish Academy of Sciences, Nowy Świat 72, 00-330 Warsaw, Poland

## ABSTRACT

Theoretical literature on whether school competition raises public school productivity is ambiguous (e.g. MacLeod & Urquiola, 2015) and empirical evidence is mixed (e.g. Hsieh and Urquiola, 2006). Moreover, competition might itself be an outcome of changes in productivity (e.g. Hoxby, 2003). We provide evidence for the negative effect of the *threat* of competition on students' test scores in elementary public schools in Poland. The identification strategy uses the introduction of the amendment facilitating the creation of autonomous schools in Poland in 2009 as an external shock to the threat of competition. We focus on the short run in which there is only a limited set of actions available to schools' principals. For the total sample we find no effect, however, for more competitive urban educational markets, we report a drop in test scores in public schools following the increased threat of competition. This negative effect is robust to the existence of autonomous schools prior to the amendment and to the size of public schools. It does not result from a pre-existing or concurrent trend either. We exclude student sorting and adjustments in schools' expenditures as potential channels.

## 1. Introduction

Disconnection between educational expenditures and student achievement (Mayer & Peterson, 1999), as well as between standard measures of school quality and student achievement (Hanushek, 2003) has turned economists' attention to the incentive structure of public schools (Betts, 1995; Hoxby, 2003). There is a substantial disagreement in the literature on how market-like incentives can impact on public school performance. For those who argue that following increased competition public schools should improve their quality (Hoxby, 2003), the basic argument is that more productive schools would drive students away from their current school. This process would continue until higher-quality schools dominate the whole educational market or lower-quality schools respond to competitive pressure. This would be true if public schools reacted to competition by increasing productivity. McMillan (2005), MacLeod and Urquiola (2013) argue, however, that schools may find it optimal to exert lower effort if the losses from the smaller market share are more than offset by the saving in effort cost. In other words, the theoretical literature does not provide a clear sign for the productivity changes in public schools due to increased competition.

Empirical evidence is also not strong, as acknowledged in a recent edition of the Handbook of the Economics of Education (Epple, Romano, and Zimmer, 2016, p. 199), and faces methodological

challenges. Most importantly, it suffers from identification problems. Usually competitors do not locate randomly, whereas ideally an exogenous variation in the size of competition is needed. The *actual* competition is endogenous with respect to market characteristics and actions of existing competitors (e.g. entry deterrence). Therefore, as pointed out by Hoxby (2003, p. 32), it is the *threat* of competition that matters.

In this paper we extend the empirical literature by providing evidence on the negative effect of the threat of competition from community schools on public school performance in Poland. Community schools are more autonomous than public schools with respect to teachers' hiring, their salaries, and collecting external funds, but they have to follow a nationwide curriculum. As an identification strategy we use the amendment to the Education Act introduced in March 2009, which facilitated the transformation of existing small public schools to community schools, but only for schools that have 71 and fewer students. The higher the percentage of students in schools with enrolment below 71, the more large public schools in the area are exposed to the threat of competition. The Polish reform is thus a source of exogenous variation in competitive pressure.

Using year 2009 as a breakthrough date in a difference-in-differences technique, we find that the higher threat of competition caused by the aforementioned reform has significant negative impact on the performance of urban public schools.<sup>1</sup> A one standard deviation

\* Corresponding author.

E-mail addresses: [p.bukowski@lse.ac.uk](mailto:p.bukowski@lse.ac.uk) (P. Bukowski), [mkobus@inepan.waw.pl](mailto:mkobus@inepan.waw.pl) (M. Kobus).

<sup>1</sup> Urban areas are more competitive educational markets than rural areas in Poland, due to a denser school network, lower transportation costs, and a more educated population.

increase in the treatment intensity leads to around  $-.03$  standard deviation change in the outcome.<sup>2</sup> The effect is similar for public schools that are larger (more than 150 and 300 students) and becomes stronger for schools that already have a community school in their neighbourhood and may thus be more aware of the consequences of the reform. We show that the effect does not result from a pre-existing or concurrent trend. The aggregate effect could be driven by changes in student population, changes in available resources or changes in productivity (i.e. residual effect) (Epple et al., 2016; Hsieh & Urquiola, 2006). We exclude student sorting and adjustments in school expenditures as potential channels.

To understand how reform increases competitive pressure, we must understand how it changes the incentives of local government and large public schools. These are related to how education is financed. Most of the schools in Poland are financed by the central government through subsidies. The subsidy from central government is tied to the pupil (the money goes with him/her). In theory this should be sufficient to cover all expenditures on education, excluding investments and pre-school education. In practice, it covers only around 50–70% of the costs (Herbst, Herczyński, & Levitas, 2009; Instytut Badań Edukacyjnych, 2011) and the rest is covered by local governments. Because of fixed costs, smaller schools yield higher cost per student and local governments have an incentive to close them down and switch pupils to bigger entities. Such a decision, however, might be not politically feasible. Parents object to closures because of a higher distance to a new school and the school's role in the cultural and social life of a local community. Community school is an attractive option for the local government, because with such schools the government does not have to finance expenditures that exceed the amount of the central subsidy. The school itself is more flexible than a public school in regulating its costs, because it is not forced to abide by collective bargaining agreements concerning teachers' wages (i.e. roughly 80% of the costs) and can acquire external funding. Due to lower costs, local politicians are incentivized to consider the transformation of all public schools into community schools.<sup>3</sup>

These changed incentives on the part of the local government create a new regime for large public elementary schools. For them, the liquidation of a small school is beneficial, because they can then capture students from a liquidated school and thus receive more funding. In the case of a handover they lose these potential funds, but now there is also a new type of competitor, with more flexibility in cost-rationalization and financing, which can steal students from them. Principals of large public schools are thus motivated to influence local politicians to close endangered schools and block the entry of new schools. It is unlikely that principals would form a coalition with parents and transform their school into a community school, because they are more free in their decisions when they respond to a local politician than directly to parents. Therefore, the ensuing number of liquidations and community schools is endogenous and subject to the degree of competition. There is also a potential heterogeneity in schools' response to the new type of competition.

Apart from the unique possibility for analyzing exogenous variation in the threat of competition that Polish reform enables, the Polish case is interesting for several other reasons. It is a transition country whereas most evidence comes from highly developed economies (mostly the United States and Scandinavia). It has experienced substantial gains in PISA scores, rising from 470 points in 2000 to 518 in 2012, placing Poland fifth in Europe and eleventh in the world. It significantly transformed its education system in the last decade.

Polish community schools differ from such schools in other countries (Heers, Van Klaveren, Groot, Maassen van den Brink et al., 2011). In Poland, they are not targeted at low or high-income students, as the main reason for their establishment is cost-rationalization. They operate like regular schools, but they are given substantial autonomy in management, which makes them similar to charter schools in the USA or autonomy schools in the UK. The current body of evidence finds modest effects of the impact of charter schools on the academic performance of public schools (Bettinger, 2005; Booker, Gilpatric, Gronberg, & Jansen, 2008). Clark (2009) analyses the British reform and finds no evidence of spillover effects of schools with increased autonomy on the neighbouring schools. Eyles and Machin (2015) study the introduction of academy schools in the UK and report positive effects on other schools. In other study, Cremata and Raymond (2014) find greater effects when the impact comes from higher-quality charter schools. This may be related to why we find a greater effect in urban areas, in which schools are generally better. Consistent with our results, using a variety of estimation approaches Imberman (2011) argues that charter schools may have negative a impact on public schools. Hoxby (2003) also exploits changes in the threat of competition and finds a positive reduced-form effect on student performance. We find a negative effect, and, in addition, we show that it was not driven by sorting of student and financial resources.<sup>4</sup>

Another strand of literature focuses on large scale voucher reforms in Chile and Sweden and exploits changes in private enrolment. In 1981 Chile introduced nationwide school choice by providing vouchers to students, resulting in 20 a percentage point increase in the private enrolment rate. Hsieh and Urquiola (2003) find that the main effect of this expansion is school stratification. This is consistent with the predictions of the reputational model by MacLeod and Urquiola (2009). If a school's reputation depends on both productivity and on the ability of its students, private schools have the incentive to boost their reputation by cream skimming the best students rather than by raising productivity. On the contrary, if schools cannot select on ability (e.g. they must select students via lotteries), then their model implies that school choice will unambiguously raise school performance and student outcomes. It seems that this is what happened in Sweden following the 1991 reform that led to the creation of independent municipality fund schools (Böhlmark & Lindahl, 2015). In the short run, on which we concentrate, school behaviour might be different than predicted by MacLeod and Urquiola (2009), because some options are not available, for instance, firing unproductive teachers. Often what remains available to school principals is either efficiency changes, that is, incentivising teachers to work harder, or boosting their school's prestige. We find no evidence for increasing teachers' salaries or investment in the infrastructure. Anecdotal evidence suggests that principals may deter the entry of community schools by shifting their attention from tasks oriented at the performance of students, to those which are visible to parents (e.g. school trips).

The paper is organised as follows. In Section 2 we describe the education system in Poland with particular emphasis on community schools and the reform. In Section 3 we present empirical strategy and data. Sections 4 and 5 contain, respectively, results and robustness checks. In Section 6 we analyse and discuss possible channels of transmission. The last section concludes.

<sup>2</sup> This magnitude corresponds to the effect of an increase of classroom size by one student in Israel or Sweden (Angrist & Lavy, 1999; Fredriksson, Öckert, & Oosterbeek, 2012) or by three students in California (Jepsen & Rivkin, 2009).

<sup>3</sup> For example, the mayor of Hanna in eastern Poland gave all public schools in his municipality to parental associations (Grabek, 2013).

<sup>4</sup> There is also related literature on the effects of decentralization in the US (Hoxby, 2000; Rothstein, 2007). This, however, provides choice between public school districts rather than between private and public schools, so this literature answers a different question and so far has produced mixed results. Similarly for the effects of private voucher-induced competition on public school performance in the USA (Abdulkadiroğlu, Angrist, Hull, & Pathak, 2016; Figlio & Hart, 2014; Hoxby, 2002).

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