Pontifícia Universidade Católica
do Rio de Janeiro

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# Decentralization and School Quality: Evidence from Brazil´s Direct Cash to School Program

**Tese de Doutorado**

Thesis presented to the Programa de Pós-Graduação em Economia of the Departamento de Economia, PUC-Rio as partial fulfillment of the requirements for the degree of Doutor em Economia.

Orientador: Prof. Claudio Abramovay Ferraz do Amaral

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## Abstract

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Decentralization to lower levels of government is considered to improve public service provision. Nonetheless, decentralization outcomes are context and design dependent. This research investigates a school decentralization program that devolves authority to the school level in Brazil. The Direct Cash to School Program transfers cash direct to school management in order to improve school infrastructure and to increase community participation at school. The autonomous budget is managed by a school council constituted with community members. Considering non-linear rules in the Direct Cash to School Program, we explore two different aspects of this program within different school samples. Our main contribution is to disentangle the effects of having a school council to manage autonomous resources from the effects of additional funding. This analysis is essentially limited to small rural schools and our findings indicate that school council resource management improve school infrastructure and slightly enhance student performance. We also explore how local community educational level affects this result. Although infrastructure upgrading was generalized, investments directly benefiting students and improvement on student performance were restricted to schools with more educated community. The other relevant contribution is the investigation of whether additional locally managed resources improve school quality in an urban setting. Our findings suggest that increasing the resources under school council control do not increase overall parent participation at school. We also obtained that additional resources improve school equipment quality instead of physical infrastructure. In addition, we also consider how different local characteristics affect these outcomes. The higher the mothers' education and the higher the community engagement at school, the greater the investment that directly benefit the students.



## Keywords

School autonomy; school infrastructure; broadband internet.

## Resumo

Costa, Joana Simões de Melo; Amaral, Claudio Abramovay Ferraz da (Orientador). **Descentralização e Qualidade da Escola: Evidências a partir do Programa Dinheiro Direto na Escola**. Rio de Janeiro, 2013. 159p. Tese de Doutorado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

A descentralização é vista como uma das possíveis formas de melhorar a provisão do serviço público. Todavia, os resultados de uma descentralização dependem do contexto local e da forma de implementação. Esta pesquisa investiga um programa que promove a autonomia escolar no Brasil. O Programa Dinheiro Direto na Escola recursos a serem administrados pela escola tendo em vista a melhoria da infraestrutura escolar e o aumento da participação da comunidade na escola. Os recursos são administrados pelo conselho escolar constituído por membros da comunidade. Considerando regras não-lineares deste programa, explora-se dois diferentes aspectos deste programa em duas amostras diferentes de escolas. A principal contribuição deste estudo é separar o efeito de introduzir o conselho escolar na administração dos recursos do efeito de mais recursos. Esta análise é realizada para escolas pequenas em ambiente rural. Os resultados apontam que a administração dos recursos pelo conselho escolar melhora a infraestrutura da escola e também eleva o desempenho escolar. Também explora-se como o contexto local afeta este resultado. Apesar da melhoria em infraestrutura ser generalizada entre as escolas, o aumento do desempenho dos alunos só ocorreu em escolas localizadas em comunidades mais escolarizadas. A outra contribuição relevante desta pesquisa é a investigação do efeito de mais recursos em escolas urbanas. Os resultados sugerem que o aumento de recursos administrados pelo conselho escolar não elevam a participação dos pais na escola. Todavia, estes recursos extras contribuem para uma melhoria dos equipamentos existentes na escola. Tais recursos são investidos mais em equipamentos do que em infraestrutura física. Também o contexto local afeta este resultado. Quanto maior a educação da mãe e o engajamento prévio da comunidade, maiores são as melhorias que beneficiam diretamente o aluno.

## Palavras-chave

Autonomia escolar; infraestrutura escolar; internet banda-larga.

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## 1.1
## Introduction

### Decentralization Motivation

Decentralization is considered to produce welfare gains through an improved allocation of public resources (Oates, 1997). The argument is that lower levels of government are closer to people and, consequently, have better knowledge about local preferences. While a central government provides the same pattern of services across different regions, a system of nested self-governments deliver public goods according to local tastes.

In addition, the failure of service delivery to the poor is often explained by the lack of governmental accountability (World Bank, 2004). Decentralization reforms are advocated as a route to reduce bureaucracy, imperfect monitoring, corruption and distortive incentives by international agencies, such as the World Bank. Bringing decision power closer to citizens is considered to change incentives towards a more responsiveness and transparent system.

The transfer of authority to local governments increases the opportunity for citizens to reveal their preferences to decision-makers. Therefore, citizens will be able to participate more and to better monitor politicians. As a result, local decision-makers will be better informed about local needs and demands. This context favors accountability in the sense that local citizens might effectively pressure local government to attend their needs. If local government deviates from local petitions, then citizens may exercise some form of punishment, for instance, not re-electing local decision-makers. As found by de Janvry et al. (2012), mayors that more effectively implemented a decentralized program in Brazilian municipalities had higher probabilities of re-election.

Considering that local government policies will be better able to commit with local demands, decentralized system will be more sensitive to heterogeneous and time-varying needs across different localities. This responsiveness is unlikely to be achieved by a central government, which is more likely to adopt standardized policies across regions. Nonetheless, centralization benefit from policy coordination and scale economies. For that reason, centralized public provision would be preferred in the case of similar preferences and large externalities across regions.

On the other hand, Seabright (1996), highlights that accountability may justify decentralization even if preferences are homogeneous. He claims that in the case of spillovers between localities, the decentralization gains of accountability must be set against its losses due to externalities. The discussion on how to choose which services should be decentralized is far from a consensus, as Weingast (2013) emphasizes that the literature introducing political mechanism to determine which public services should be decentralized result in inefficient assignment and service provision.

Contrasting to Seabright (1995), Bardhan and Mookherjee (2005) consider that decentralization does not necessarily improve accountability. Local elite may pressure local politicians to act according to their interest while local community may lack the ability to voice their needs. Consequently, local public resources might only benefit local elite in a decentralized system. In this case, decentralization might actually reduce welfare and degrade public service delivery even if compared to a corrupt and inefficient centralized government.

Community characteristics that favor local democracy will contribute to reduce elite capture in a decentralized system. Examples of these characteristics are higher educational level of citizens and local bureaucrats, political awareness of citizens, no social or economic impediment to citizen participation, availability of trustworthy information, transparent rules, and fair elections. Other features that improve accountability and reduce corruption in a decentralized context are minorities' reservation seats in local government (Chattopadhyay and Duflo 2004), media campaigns (Reinikka and Svensson 2011) and monitoring by higher level governments (Olken 2007).

Therefore, decentralization outcomes will be determined by the interaction between decentralization design and local characteristics. The context and design dependence of decentralization impact is well illustrated by Bardhan and Mookherjee (2006) that present case studies of eight countries, covering more than half of the world´s population. Precisely for being context specific, decentralization might increase inequality in service delivery between regions with a functioning local democracy and those with a malfunctioning local democracy. Nonetheless, if properly designed and implemented, decentralization might not produce this efficiency-equity trade off.

Besides improving local service delivery, decentralization has also the potential of improving governance by increasing political competition, reducing political instability (conciliating ethnic conflicts), and limiting government power (Faguet 2012). But, as previously argued, design and implementation are fundamental for the achievement of these outcomes.

The ambiguous decentralization outcomes predicted by theory are inherent to any reform that delegate authority to lower levels of administration. Nevertheless, decentralization reforms have been adopted to improve a variety of public services (World Bank, 2004). In this study, our focus in on decentralization reforms aimed at improving school quality.



## School Decentralization Reforms

How to improve education has been largely debated by both policy makers and researchers. Many policies have been found effective to attract students to school but no consensus has been achieved on strategies to improve student learning. We may cite health interventions (see Miguel and Kremer 2004 on deworming) and programs that reduce the cost of schooling (see Burde and Linden 2013 on smaller school distance, Muralidharan and Prakash 2013 on cycling to school program, and Fiszbein et al. 2009 on cash transfers) as successful policies to raise school enrollment. On the other hand, several actions were experimented to increase student achievement but the evaluation outcomes are conflicting.

A pure resource policy is considered to have limited effect on school quality (Hanushek 2006). In fact, several evaluations of interventions aimed at increasing school inputs produce disappointing effects. For instance, provision of textbooks (Glewwe et al. 2009) and flip charts (Glewwe et al. 2004) in Kenya did not improve student scores. A book program in Philippines (Abeberese et al. 2012) translated into a temporary modest increase in reading test scores but no effect on other subjects. Computer is an instructional material used by several programs but the evidence on student learning is mixed. While some evaluations concluded that more computers are not effective to boost student learning (Angrist and Lavy 2002 and Cristia et al. 2012), others have found encouraging results (Banerjee et al. 2007, Carrillo et al. 2010 and Lai et al. 2012). Even though there are several differences concerning local settings and program implementations, the comparison of these computer-based interventions suggests that computer use might be more effective if integrated to curriculum design. Conflict is present even when considering school inputs other than instructional materials. As an example, Angrist and Lavy (1999) find positive results on student performance due to class size reduction whereas Duflo et al. (2012) find less promising effects if reducing class size is not combined to other intervention.

One possible explanation for the counter-intuitive null result of school inputs on learning is that there is "crowding out" of school resources. Das et al. (2013) report evidence for Zambia and India that unexpected grants to school improve student learning but no change is observed if the grant is expected. Their results suggest that household spending on education diminishes in response to anticipated grants and this could be one of the explanations for the previous findings.

Other researches argue that the limited impact of additional resources in educational outcomes is due to system distortions and lack of incentives (see Hanushek 2006 and Kremer and Holla 2009). Therefore, resource policies should be combined with interventions aimed at changing incentives in order to actually improve learning. Indeed, incentive interventions are seen as promising strategies to boost school quality. Among incentive interventions, we may cite information dissemination for school community, teacher performance-pay, performance based funding for schools, and school decentralization reforms.

This study is related to school decentralization reforms. Among different designs of decentralization reforms, school autonomy is seen as one of the most promising accountability reforms to enhance educational outcomes (Bruns et al. 2011). School-based management reforms assign decision-making authority to school level, thus making the decision process faster and less bureaucratic. Transferring authority to school is considered an innovation with potential to enhance local community participation, avoid elite local capture, promote transparency and reduce fraud. In addition, school community empowerment may lead to a greater effort and engagement of school members, and, consequently, to better educational outcomes.

However, as previously argued, school decentralization could have negative or null results in education quality if local agents lack technical skills to manage resources, if local elite misappropriate the resources or if divergences are accentuated among school community members (Gertler, Patrinos and Rubio-Codina 2007; Galiani and Perez-Truglia 2011).

Furthermore, Hanushek et al. (2011) argue that the lower the level of development and the worse the quality of local institutions, the stronger these channels that corrupt the local decision-making process. Indeed, Galiani et al. (2008) find that positive results of decentralization in Argentina on student achievement were restricted to schools in non-poor areas, and Hanushek et al. (2011) present some evidence that more school autonomy promoted student attainment in high-income countries but not in low-income ones. Also Madeira (2012) estimates that decentralization raised student dropout and failure in Brazil (São Paulo), particularly on rural and poor areas.

In addition, Beasley and Huillery (2012) claim that the success of beneficiary's participation in a program depends on the local community characteristics. Community preferences, ability to participate in the program and costs of participating must be considered when evaluating or designing a participatory program. Gunnarsson et al. (2009) highlight that positive results from decentralization depends on local context and find, through an analysis of eight Latin

American countries, that parent participation is associated to community size, location and parental human capital.

There is a huge variety of school-based management reforms taking place, since they depend on a combination of which community members and which school operations are involved. The school decision-maker committee could include some arrangement of principal, teachers, parents or other school community members and their responsibility could be over budget allocation, personnel decisions, student achievement monitoring and/or curriculum design, among others. For instance, a "weak" form of school autonomy would be one where school councils have only advising function while in a "strong" form school councils would receive funding straight from the central government and decide on issues such as teacher hiring/firing and curriculum outline (e.g. EDUCO program in El Salvador - *Educación con Participación de la Comunicad*) (Barrera-Osorio et al., 2009).

The empirical evaluations of strengthening community participation at school provide mixed evidence. The mere introduction of school councils is not necessarily correlated to improvement on school indicators (see Chaudhury et al., 2006, and Paes de Barros and Mendonça 1998) and many current school autonomy reforms involve actions to empower already existing parent-teacher associations. Gertler, Patrinos and Rubio-Codina (2012) evaluate a program in Mexico called *Apoyo a la Gestión Escolar* (AGE - Support to School Management), designed to provide monetary support ($500-$700 per year) for the schools´ parent associations. Based on a difference-in-differences methodology, they conclude that this program led to a reduction of 7.4% on grade failure. According to Bruns et al. (2011), there is an ongoing randomized control trial to evaluate the effects of doubling the AGE funding and preliminary results would suggest an impact on test scores (5-5.6% for Spanish and 6-8% for Math).

There are several studies empirically assessing school autonomy reforms (see Bruns et al. 2011), but a few rely on credible identification strategies. Lassibille et al. (2010) analyses a randomized intervention in Madagascar that improved the pedagogical process management at the school level (and also at the sub district and district levels) combined with support for community participation. They report

positive effects in student attendance and performance in contrast to no effect when the intervention was restricted to higher administrative levels (sub district and district). In addition, Glewwe and Maïga (2011) do not find heterogeneous results of this program according to different types of teacher. Another example of positive findings on student achievement is Duflo et al. (2012), which examines a randomly assignment of resources for parent-teacher associations (PTA) to hire novice teachers in Kenya. The training provided to PTAs members improved the results.

On the other hand, some empirical findings suggest restrictions on school autonomy reforms impact. In a randomized evaluation in Indonesia, Pradhan et al. (2011) find that elections of school committee members and stronger commitment between school committee and village council had positive impact on test scores; however, a block grant ($326) and training for school committee had no effects alone.

Limited result for school-based management reform is also obtained by Blimpo and Evans (2011). They evaluate a randomized control trial in Gambia that involved school-management training for school community. This program resulted in a reduction of student and teacher absenteeism but the improvement on learning outcomes occurred only in villages with higher literacy levels.

In India, Banerjee et al. (2010) found no effects of randomized interventions that provided information about village education committees´ role for community members not even if they were trained for monitoring learning outcomes. Their findings suggest that these actions were not enough to boost community participation and monitoring. As Beasley and Huillery (2012) suggest, actions to empower local community depend on local context to succeed. They evaluate a randomized program in Niger that increased the grants under the school committee control (on average $209 per school). Their findings suggest that parent participation improved, especially where community has higher taste for education, higher real authority and low cost of participating. It is also found a general improvement on infrastructure quality and school enrollment.

## Our contribution

The two following chapters explore non-linear rules in a federal program in Brazil named *Dinheiro Direto na Escola* (PDDE - Direct Cash to School Program), which provides cash to be locally managed by the school community. Within the context of this school autonomy program, we aim at estimating the effects of additional resources to school community and the effects of introducing school community in resource management. We also investigate heterogeneous effects according to local contexts.

Even though the program *Dinheiro Direto na Escola* does not constitute a randomized control trial, its design also provides a reliable identification strategy. We provide findings that rely on regression discontinuity designs as an identification strategy[1]. This is also relevant since credible evidence is still uncommon on the evaluation literature of school-based management reforms.

In the second chapter, we explore the fact that this program awards schools that achieve student performance targets with extra financing resources. Therefore, the comparison of outcomes between schools that almost accomplished their targets with those that barely succeed allow us to identify the impact of increasing the school committee´s budget. More resources in a school-based management context is more likely to improve school quality since in a decentralized context local agents have better knowledge of school needs and are subject to local accountability. In addition, more resources to local community may translate into school autonomy strengthening, which might positively impact school quality.

Due to a detailed dataset on school infrastructure, we are able to uncover the investment decisions on school infrastructure quality. Besides the quantity, we also investigate the quality of several infrastructure items. This chapter studies how resources were allocated towards equipment and physical infrastructure quality. We find that the additional funding to the school committee did not improve student performance, measured as test scores, approval rate and dropout rate[2]. However, we

[1] The use of regression discontinuity design as an identification strategy was already used by Clark (2009) in the UK context of school autonomy reform.

[2] The lack of effect on student scores due to more resources in *Programa Dinheiro Direto na Escola* (Direct Cash to School Program) has also been found in Rocha (2011). He takes advantage of jumps in

find that school infrastructure had some improvement, especially on equipment opposed to physical infrastructure.

Another relevant contribution of this chapter is the investigation of heterogeneous effects due to the local characteristics. As previously discussed by others, e.g. Hanushek et al. (2011), Galiani and Perez-Truglia (2011) and Beasley and Huillery (2012), the school-based management reform outcomes will depend on the local context. Nonetheless, remains unanswered the question of which settings contribute to local participation improving education quality. Local characteristics that reinforce accountability will positively contribute for the decentralization reform. For that reason, we investigate whether results are different according to mothers' education and previous community engagement at school.

Higher educational level might increase mother taste for education, improve mother skills to manage the funding and provide *de facto* authority for them. We consider schools with mothers more educated those where more than 50% of the mothers have at least the primary school. The other local feature considered is former community participation. If parent-teacher association holds meetings regularly (more than 3 per year) and if parents are organizing school community activities, then school community already has some level of commitment with the school and some developed sense of school ownership. Indeed, in both scenarios, an increase of resources managed by a school committee led to higher improvements in both physical infrastructure quality and equipment, especially on equipment items towards direct students use. Our findings suggest that local context is very important to determine better resource use by local community. This is consistent with previous conclusions from Galiani et al. (2008), Hanushek et al. (2011) and Beasley and Huillery (2012). Nonetheless, the improvement of infrastructure quality was not enough to boost academic performance.

Our results contribute to the literature that investigates the effect of more resources on education but also to the school autonomy literature because it represents an exogenous variation of resources in a context of community-based

funding at some cutoffs of the school number of students in order to investigate the effect of more resources on test scores in São Paulo.

management, which represent a less distortive framework. In addition, the findings of the chapter also contribute to the literature that address whether school funding should be based in performance. While many studies investigate if incentives are leading to more productive spending (e.g. Olken, Onishi and Wong 2012), Bacalod, DiNardo and Jacobson (2012) examine if rewards are used to improve student achievement. Their findings are that resources were not committed to instructional material or teacher contracting, which resulted in no effect on student performance. We also find that the awards received did not improve student outcomes. Nevertheless, our results are qualitatively different since in our framework there is community participation, and this feature was expected to possibly reverse the results. Moreover, our data set allow us a more detailed investigation of the infrastructure quality and also an investigation of heterogeneous effects due to local institutional settings.

The third chapter aims to go even further, since we attempt to disentangle the effect of including community members on management from the effect of more resources. This is especially relevant since most of the empirical evidence produced so far on school-based management (or, more generally, on school decentralization) do not achieve this task. The problem is that usually school decentralization reforms also involve funding increase. One exception is Blimpo and Evans (2011) that randomly provided community training and extra resources for a group of schools whereas other schools received only additional resources.

We begin by estimating the effect of a combination of additional resources and the introduction of school council to manage resources. In order to achieve this objective, we take advantage of a rule that determines that schools with 51 students or more must constitute a school committee whereas smaller schools have the option of not having such organization. Schools without a council will receive resources through the local government (instead of receiving it straight from national government to the school committee bank account) and the principal will be responsible for resources usage.

It is interesting to note that we are actually comparing two forms of decentralization. One where principal and local officers are responsible for resource

allocation and the other is characterized by the participation of parents on funding management. The second type is likely to reduce local capture of resources since parents are empowered to monitor. This investigation is relevant to understand the relative effectiveness of different decentralization reforms. Moreover, the outcome might reveal designs that contribute for improving decentralization results.

Comparing schools with a little less than 51 students and those immediately above the 51 cutoff allow us to estimate the effect of having school community managing resources. Unfortunately, the 51 threshold also determines that school will receive more resources from the program. Therefore, the estimates at the 51 cutoff also incorporate a resource effect.

Nonetheless, we consider other settings where it is observed only an increase of resources in order to compare effects from a pure-resource policy with those from a combination of extra funding and school council management. One of those settings is at the 100 student threshold, since schools with 100 students or more also receive an abrupt increase of resources. Schools in the neighborhood of the 100 student cutoff have school committee, and the effects at this cutoff are related only to additional resources. Therefore, we compare results at the 50 student cutoff with those at the 100 student cutoff in other to understand the possible consequences of increasing community participation in resource management.

In addition, throughout the period analyzed (2007-2012) many schools below the 51 student cutoff chose to constitute a school committee to manage resources so that, more recently, there is no discontinuity in the proportion of schools with a school committee at the 51 student threshold. In most recent years, this cutoff represents only a discontinuity in the amount of resources. Therefore, contrasting the impact at the 51 student cutoff in the previous years to the impact at the 51 student cutoff in the last years led to an estimative of the effect of involving the school community into resources management.

In other words, considering the 51 student threshold, we estimate the effect of having received more resources in the years 2008-09 on school outcomes in 2009 and also the effect of more resources in 2011-12 on school indices in 2012. We understand the difference among these results as a consequence of the fact that more

resources in 2008-09 are combined with having a school committee to manage resources for two years.

Our findings suggest that more resources joined with the introduction of school council management resulted on higher improvements on school infrastructure, especially equipment, and slightly better student achievement than in the scenarios with only increasing resources. This suggests that positive results were mainly driven by the participation of parents in management. This can be interpreted as an indication that decentralization designs with mechanisms that actually empower local community have the potential to enhance results.

We also contribute to the understanding of how local characteristics affect community participation outcomes by examining heterogeneous effect considering the literacy rate among adults in the municipality. We obtain that the positive impact of the combination of more resources and school council management is concentrated in schools located at municipalities with higher literacy rate among adults.

The positive effects of having parents in resources management are consistent with the findings of Pradhan et al. (2011) and Lassibile et al. (2010). The fact that better results were localized in schools for which local community is better educated converges with previous conclusions by Blimpo and Evans (2011), Beasley and Huillery (2012) and Galiani et al. (2008).

In addition to these outcomes, we also observe as a non-expected impact the increase on the proportion of more educated teachers. The empowerment of parents to manage resources might change school dynamics in other dimensions than the ones previewed by the reform. To a certain extent, this result is aligned to the findings in Duflo et al. (2012), especially considering that the improvements on teacher qualification were restricted to schools located in more educated areas.

The sample of primary schools considered in the second chapter is very different from those at the third chapter. While the first is composed only of urban schools, the second is essentially rural schools that are overrepresented at the northeast region. The source of infrastructure data is also different. For the first group we have very detailed information, whereas for the second only more limited data is available. Nevertheless, it is interesting to note that some results were similar.

Namely, local managed resources were averagely used to improve school equipment rather than physical infrastructure. In addition, resources resulted in higher infrastructure development directly benefiting student welfare in schools where local community has higher educational level. This constitutes evidence that community level of education affects the functioning of decentralized systems.

## 1.2
## Institutional Background

### Brazil´s Decentralization Process

The background of decentralization reform in Brazil was a transition of the national political system. After 20 years of military dictatorship, Brazil was moving to democracy. This constituted an opportunity for regional elites to change distribution of power through decentralization. In addition, the last years of the military regime were characterized by poor economic growth, rise in poverty and failure of social-service delivery. Hence, social movements were also claiming for decentralization and more popular participation in order to reduce bureaucracy, increase responsiveness and improve efficiency in service delivery. International agencies were concerned with default risk and also encouraged the adoption of a decentralized system in order to tight fiscal control. Therefore, the 1988 constitution and the decentralization reform were shaped reflecting all these contradictory interests.

At the end, local governments were given greater political and fiscal autonomy and responsibility for social service provision. Baiocchi (2006) describes conflicting evidence about decentralization effects on service provision. Despite an observed increase of basic education and health indicators, there are ambiguous effects of inequality between regions. Indeed, Souza (2002) claims that Brazilian decentralization has been unable to tackle regional disparities and local governments have very imbalanced abilities to assume their responsibilities and respond to local demands.

On one hand, decentralization opened way for the adoption of institutional innovations to improve popular participation, such as Participatory Budget. On the other hand, poorer and smaller municipalities faced high dependence on inter-governmental transfers and inability to provide social service for which they are responsible.

In the educational scenario, the municipal system did not take off. Some states carried out their own reforms in other to encourage municipalities to assume schools and students as their responsibilities (for instance, see Madeira, 2007, for São Paulo´s experience). The Constitution determined that 25% of municipality and state revenues should be earmarked to education; even so, there was neither high government supervision nor strong local monitoring of this expenditure in most municipalities.

The central government assumed the responsibility of ensuring education equity and promoted an education reform to address these issues (Draibe 2004 and Sands Jr. 2008). In 1996, it was approved a new national education law, the *Lei de Diretrizes e Bases da Educação Nacional* (LDB). This law established minimum qualification for teachers and changed national curriculum standards. It also reinforced constitution determination that municipalities should assume responsibility for education provision. Primary education would be a responsibility of both state and municipal governments. In addition to primary education, municipalities were also assigned authority to provide pre-schools whereas states were accountable for high school education.

Aiming at a more equal distribution of education resources, national government launched a new funding mechanism in 1998, the *Fundo de Manutenção e Desenvolvimento do Ensino Fundamental e de Valorização do Magistério* (FUNDEF/ Fund for Maintenance and Development of Primary Education and Promotion of Teacher Career) (Draibe 2004, Sands Jr. 2008 and Gordon and Vegas 2004). Municipalities and states would contribute with a percentage of their revenues (15% of the value of four main intergovernmental transfers) to create a primary education state fund. Then, the money of each state fund would be redistributed among municipalities within state and the state according to the number of primary students enrolled in each system. This guarantees equality across municipalities within state.

In addition, national government complements funding in states where local contribution is insufficient to ensure a minimum allocation per-student required nationally, thus, promoting equality among states.

All money received from FUNDEF must be spent on education and at least 60% of this amount must be on the benefit of teachers. Municipalities were urged to renovate promotion standards of public teacher career. Moreover, municipalities were also compelled to create councils to monitor FUNDEF expenditures. In sum, this reform also intended to control local government discretion over education resources while creating mechanisms for community monitoring.

As a result of this reform, there has been a substantial increase in municipal education system. At this time, primary education comprised eight years (7 to 14 year-old children). Municipalities would largely take control over the first four years (1st cycle of primary education) while states would mostly be responsible for last four years (2nd cycle of primary education)[3]. After 2006, the FUNDEF was replaced by FUNDEB (*Fundo de Manutenção e Desenvolvimento da Educação Básica e de Valorização do Magistério* / Fund for Maintenance and Development of Basic Education and Promotion of Teacher Career). FUNDEB is essentially an enlargement of FUNDEF in order to include pre-primary education and secondary education.

The education reform in the 1990´s also involved experiments with other institutional innovations. In 1998, a group of schools participated of a pilot program largely financed by the World Bank named *Plano de Desenvolvimento da Escola* (PDE/ School Development Plan). In this program, teachers and parents would receive financial and technical support to identify school main difficulties and elaborate a plan to challenge these problems (see Carnoy et al. 2008). This program is still functioning nowadays.

[3] In 2005, Brazil initiated a process to adopt a 9-year primary education system, including 6 to 14 year-old children. The 1st cycle of primary education would consist of the initial 5 years while the 2nd cycle would comprise the last 4years.

## The Direct Cash to School Program (PDDE)

Launched in 1995, the program *Dinheiro Direto na Escola* /PDDE (Direct Cash to School Program) was the first to establish a direct transfer from national government to schools. In the context of a decentralized system where resources transferred to local governments would not necessarily benefit schools due to widespread problems of corruption and governance (Ferraz, Finan, and Moreira 2012), this was an effective way to bypass all levels of bureaucracy. The idea was to provide schools with autonomy on how to spend at least part of the resources. In addition, introducing community in management might also increase overall parent participation in education with positive results to school quality.

The administration of the program is conducted by a federal institution named *Fundo Nacional de Desenvolvimento da Educação*/FNDE (National Fund for Educational Development, an organization connected to the Ministry of Education). The PDDE initial name was *Programa de Manutenção e Desenvolvimento do Ensino Fundamental* (PMDE/Program for Maintenance and Development of Primary Education). Since then, not only the name but also some characteristics changed in order to reduce the program bureaucracy, simplifying school entrance to the program and resource transference. For instance, it is not necessary for schools to sign a contract in order to participate. The only requirement is that larger public schools must have an established school council with a bank account in order to receive and manage resources. In 2009, this program was expanded to cover pre-primary and high-school education.

The program provides supplementary funding for public schools to improve its physical and pedagogical infrastructure. The extra income is granted once a year and its allocation must be decided by the school community. The use of funds is restricted to school maintenance, equipment´s expenses, pedagogical project´s implementation or school activities´ development. It is also established that 80% of the funds should be destined to maintenance spending or nondurable goods and the remaining 20% should be for providing durable goods. The payment of wages or taxes is expressly forbidden.

In order to receive the PDDE´s monetary support, school with at least 51 students must establish an association called *Unidade Executora* (Implementing Unit), which works as a school committee. Before 2005, the threshold that determined the obligation to have a school committee was 100 students (this change can be observed at the FNDE regulations *Resolução/CD/FNDE nº 16* and *Resolução/CD/FNDE nº 17*, see FNDE 2005 and FNDE 2004). The school council has some discretionary power on the functioning of this association; nevertheless, the program provides a guidebook with instructions about the implementation and the operation of the school committee. The guidelines of the manual determine that the members of this organization should be elected by the school community and that any member of the school community can be candidate. It is also strongly recommended that all school community members should be represented in this organization. In addition, it is stated that the president of the committee should also be elected, among the members of the school community, not necessarily the school principal (FNDE, 2009).

The school council must have a bank account in order to receive the program transfers straight from the federal government. This association is responsible for deciding the PDDE´s resource allocation and for annually preparing reports for the local government level. If the reports are not approved or not delivered, the school is no longer eligible to PDDE program.

Alternatively, schools with less than 51 students have to decide about the school committee constitution. For those schools that do not establish a school committee to manage the resources, the cash transfer will be received by the educational secretariat of either the municipality or the state (depending whether the school is under municipal or state control). Nevertheless, the school (most likely, the school principal without consulting other community members) must settle the priorities in order to determine the resource allocation.

Other feature of this program is that the amount assigned to each school is defined according to the total number of students. The total funding provided to schools presents discontinuity jumps at certain thresholds of the total number of students (namely, 51, 100, 501, 751, 1001, 1501 and 2001). Taking into consideration

regional disparities, the program determines that rural schools, and schools located in the North, Northeast and Center Regions receive a higher per-student value. The number of students is taken from School Census, which is an annual survey collected by the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP/ National Institute for Education Research). This institute sends questionnaires to be filled out by schools and later aggregates information about their physical and human resources.

Since 2007, an additional element of PDDE is that primary urban schools for which the individual quality target is achieved receive 50% more resources for two consecutive years (this was instructed by the following FNDE regulation: *Resolução/CD/FNDE nº 9*, see FNDE 2007). The school quality is measured by the index IDEB (*Índice de Desenvolvimento da Educação Básica*/Index of Basic Education Development), which was created by the Brazilian Ministry of Education in 2007 as a tool for monitoring educational progress. IDEB´s formula combines pass rates and test scores and it ranges from zero to ten. The grade progression is taken from administrative data, the School Census, while the tests scores are part of a national exam named *Prova Brasil* (Brazil Test). The national exam happens every two years since 2005 (2005, 2007, 2009 …), so IDEB results are biannual. For 2007 on, there are IDEB targets set for each school by the Brazilian Government. The targets were planned with the aim of enhancing the national IDEB from 3.8 in 2005 to 6.0 in 2022.

Actually, each primary school constituted by all nine primary grades has two IDEB scores and two IDEB targets, one for each cycle of primary education. The *Prova Brasil* is applied to fifth and ninth grades, which are the last grade of the first and the second primary cycle, respectively. Hence, the IDEB score for each primary cycle consists of an averaged pass rate for the whole cycle combined with the last grade test score. If a complete primary school achieves its IDEB target of only one of the primary cycles, then the 50% increase is applied only to the PDDE´s income relative to the students of that cycle.

Considering primary schools controlled either by municipality or state, the program coverage has been pretty sizeable and constant. For the period 2007-2012,

the program comprised approximately 92% of urban primary schools and 80% of rural schools in each year. This means that 50,272 primary urban schools and 55,334 primary rural schools received PDDE funding in 2012. The median value transferred to primary urban schools was R$6,870 (approximately U$3,435). For primary rural school this amount was R$2,302 (nearly U$1,151).

It is not possible to exactly estimate the effect of PDDE transfers on school budgets since there is no information available on total funding received for each school. Nonetheless, we consider FUNDEB resources to compare with PDDE´s. As previously explained, FUNDEB constitute the main source of education spending by states and municipalities. In 2012, FUNDEB comprised R$2,495 (U$1,248) per student to be invested in pre-primary, primary and secondary education. Nonetheless, the law determines that at least 60% of this funding should be spent with teacher payment. Hence, the maximum amount available for investment in school physical and pedagogical infrastructure would be R$998 (U$499) per student. The total PDDE transfers in 2012 signified an amount of R$13 per student, which represents 1.3% of total resources from FUNDEB available to infrastructure investment. Note that this percentage may strongly vary across schools because municipalities and states have the discretionary power to choose the level of investment in each school. In addition, municipalities and states may spend even more than 60% of FUNDEB on wages so that infrastructure investment is smaller.

Even though PDDE transfers are not large, the amount received for each school is comparable to other school autonomy programs in different countries. For instance, the Mexican program *Apoyo a la Gestión Escolar* (AGE) provided U$500-U$700 per year for parent associations (Bruns et al. 2011) and a randomized intervention in Niger granted U$209 to school committees (Beasley and Huillery 2012). Evaluations suggest that the first improved student learning while the second enhanced parent participation and student enrollment. The resources provided within a school-based management context serve to strengthen the school autonomy.

The introduction of community participation in management through the establishment of school councils is one of the leading features of PDDE. This innovation is supposed to change school dynamics by empowering parents. In 1995,

there were 11,643 schools with school councils to manage PDDE resources (FNDE, 2008). This number was larger than 75,000 in 2003 and superior than 106,000 in 2012. This means that the proportion of schools with a council rose from 64% to 80% in the period 2003-2012. If more parent participation in resource management actually modify school functioning, the expansion of school councils was a relevant change introduced by PDDE.

A few qualitative studies have been done in order to better understand the functioning of the school council within the PDDE context. Peroni and Adrião (2007) present an analysis for 10 schools in 5 different Brazilian states (one in each Brazilian region). Even though the funding from PDDE is not considered sufficient by school community, the resources are recognized as responsible for improvements in both physical infrastructure and equipment.

They describe that, even before PDDE, several schools already had some type of parent-teacher association. Nonetheless, this organization was inoperative in many schools. Therefore, PDDE was important either to reactivate or to initiate parent-teacher associations in schools. Even in schools with a well-functioning committee, PDDE introduced school councils into monetary resources decisions, thus encouraging participation.

Peroni and Adrião (2007) remark that the school principal plays a central role within the decision making process in the school council. Community participation in decision making is enhanced in schools where parent-teacher associations were previously active. However, even in schools where parents have restricted participation in determining budget allocation, they do monitor spending.

Some problems concerning school council functioning were reported in Peroni and Adrião (2007). For instance, there were some cases describing the lack of regularity for school council meetings or the inability of parents in understanding PDDE details. Nevertheless, they remark that these committee meetings represent the only opportunity for parent participation in many schools.

## 1.3
## Data

All information related to the Direct Cash to School Program (PDDE) was obtained from the *Fundo Nacional de Desenvolvimento da Educação* (FNDE - National Fund for Educational Development). FNDE is the federal institution responsible for transferring federal resources direct to schools. In the data from FNDE, there is information about the budget allocated to each school through PDDE and also whether there is a school council responsible for managing resources at each school. We collected this information for the period 2003-2012.

In this research, we study different aspects related to the program PDDE considering two very different samples of schools. In the second chapter, which investigates investment decisions made by the school council, we consider only urban schools for which students have taken the test of a national assessment system called *Prova Brasil*. The third chapter aims to understand the effects of having a school council to manage resources for schools that have nearly 50 students. These are very small schools that are basically rural and do not participate of *Prova Brasil* evaluation. Therefore, in the second chapter we are able to explore very detailed information on school infrastructure from *Prova Brasil* microdata but not in the third chapter.

As previously mentioned, *Prova Brasil* is a national assessment system that biannually applies Math and Portuguese tests to primary students. In addition to the tests, *Prova Brasil* comprises questionnaires to be filled by an interviewer, the school principal, teachers, and students. These questionnaires provides very detailed information about infrastructure at school and also several other school characteristics. For instance, there is information concerning parent involvement at school through parent-teacher associations or whether parents organize activities at school. In the second chapter, we use this information provided by *Prova Brasil* and we explain in detail the variables that were considered in the analysis.

In both chapters, we were able to use information available at the School Census, which is provided by the *Instituto Nacional de Estudos e Pesquisas*

*Educacionais* (INEP/ National Institute for Education Research). Annually, this institute gathers information from questionnaires filled out by schools. Schools report several characteristics related to their infrastructure, teachers and students. It is relevant to mention that there was a change in the methodology for collecting the School Census. The school used to be the unity of analysis, so that all characteristics reported were at the school level. From 2007 on, the student is the unit of analysis. Thus, School Census provides specific information for each student, each class and each teacher. This methodological change is especially relevant for the analysis in chapter three. Previous to the reform, schools could more easily manipulate their enrollment in order to receive more resources. The new methodology imposes a higher control on the information declared by schools, since each student in the system is identified. It is even possible to follow the student even if he changes schools.

Some School Census variables were used in chapter two but it is chapter three that relies more on Census information. Because chapter three focuses on smaller schools that do not participate of *Prova Brasil* assessment, infrastructure variables in Census are used. Unfortunately, infrastructure information in the Census is less informative than at *Prova Brasil*. Since we consider different samples and different variables on chapters two and three, we provide more detailed information at each chapter. Also descriptive statistics about each sample is informed when explaining variables in the following chapters.

We also collected information on dropout, failure and pass rates for each primary school from the INEP website (www.inep.gov.br). In addition, the School Census and *Prova Brasil* microdata are also available at the INEP website.

In the third chapter, we also used information about literacy rate among adults (over 30 years old) for each municipality in 2010. This data comes from the Population Census, which is decennially collected by the *Instituto Brasileiro de Geografia e Estatística* (IBGE/ Brazilian Institute of Geography and Statistics).

# CHAPTER 2
# Does More Autonomous Spending Work?

## 2.1
## Introduction

The objective of this chapter is to examine if additional funding to school committee improves school quality. Considering that school committees know better local needs and are held accountable for their decisions, the idea is that a resource policy in a school autonomy context may enhance the investment in most productive school inputs, thus improving school infrastructure and student learning. Other channel through which more resources in a school-based management context might lead to better school quality is by strengthening school committee role. A more empowered community is going to be more participative and active in promoting school quality. Therefore, we investigate whether additional funding resulted in increased parent participation, better school infrastructure, and also better student learning.

Increasing resources that are under school committee control as a way to encourage community participation and improve the effectiveness of resource usage is seen as a weak type of school-based management reform by Bruns et al. (2011). Despite different designs, this type of reform has been implemented in diverse contexts. For instance, Mexico adopted it through the program Apoyo a la Géstion Escolar (AGE) and Cambodia, via the Education Quality Improvement Project (EQIP). Both programs have positive non-experimental evaluations according to Bruns et al. (2011). In addition, experimental interventions have begun to consider this type of reform. A randomized evaluation has been done in Mexico by doubling AGE funding with some positive preliminary findings on student learning (Bruns et al., 2011). Duflo et al. (2012) obtained that randomly providing school councils resources to hire teachers in Kenya improved student test scores. On the other hand,

in Indonesia, Pradhan et al. (2011) find no effect if additional grant to school committee was provided alone in a randomized intervention.

As pointed by Beasley and Huillery (2012), conflicting empirical evidence on actions to empower local community might be consequence of not only different policy designs but also local context. They argue that community preferences, ability to participate and participation costs are crucial for the success of such policies.

The Direct Cash to School Program (PDDE) determines that schools must have a committee responsible for managing the autonomous resources. Schools that achieve their quality target based on student performance receive a 50% increase over the resources transferred to school council budget from PDDE. This Brazilian context provides a regression discontinuity design that allows us to identify the effect of giving more resources to school councils. We examine whether extra funding encourages community engagement at school and whether these resources improve school infrastructure. Through these channels, extra grant to school council could result in better student test scores, which is also investigated.

Additionally, we also explore how local context interacts with our findings. Previous studies have found heterogeneous effects according to local characteristics. For instance, Beasley and Huillery (2012) found that a grant to school council improved parent engagement especially in communities with higher taste for education, higher real authority and low cost of participation. Indeed, the functioning of PDDE program has been found to vary in different local contexts according to a qualitative research conducted by Peroni and Adrião (2007). They found that, in schools where parent-teacher associations were active previous to PDDE, parents would have a more important role in deciding resource allocation.

Taking into account that local characteristics affect the functioning of a decentralized system, we study heterogeneous outcomes considering mother´s education level and previous community engagement. More educated mothers and more engaged parents may indicate that parents care about education and that they have the needed abilities to participate in the program. Therefore, we expect more resources to produce better outcomes in contexts where mothers are more schooled and community more previously engaged.

The following section describes the data and reports descriptive statistics. After that, we discuss the identification strategy and, then, we present the results about the effects of more resources within a school autonomy framework. Finally, we discuss and summarize the results of this chapter.

## 2.2
## Descriptive Statistics

As previously mentioned, information about the Direct Cash to School Program was obtained from FNDE, a national institution related to the Ministry of Education. Table 2.1 provides a general picture of the transfers provided to schools in the period 2008-2009. Our sample is restricted to urban primary schools with quality index targets set to 2007 (this implies schools that participated of *Prova Brasil* 2005 edition).

### 2.2.1
### Information on resources managed by schools

As previously mentioned, information about the Direct Cash to School Program was obtained from FNDE, a national institution related to the Ministry of Education. Table 2.1 provides a general picture of the transfers provided to schools in the period 2008-2009. Our sample is restricted to urban primary schools with quality index targets set to 2007 (this implies schools that participated of *Prova Brasil* 2005 edition).

For primary schools with 1st cycle students, the average amount received was R$14,836 (approximately, U$7,418) during 2008-2009. Among the 19,182 1st cycle schools, 14,758 schools achieved their quality index goal in 2007 and received an average bonus of R$5,198 (U$2,099). The 2nd cycle schools comprise a group of 7,920 schools with an autonomous budget of, on average, R$19,192 (U$9,596). Among these schools, 6,370 were rewarded with an extra transfer of R$6,702 (U$3,351) for accomplishing quality target in 2007.

Even though the extra amount received by school committees is not that large (roughly U$1,000- U$1,600 per year), this resource will probably be used in a productive way to improve school quality due to incentives present in a school autonomy context. In addition, granting school committees with a reward might reinforce school-based management and enhance school community empowerment, thus resulting in better educational outcomes. Furthermore, this additional funding is comparable to interventions in other countries that had some effect on school quality indicators. As examples, we may cite a support of U$500-U$700 for parent associations in Mexico (Bruns et al. 2011) and an increase of U$209 to school committees in Niger (Beasley and Huillery 2012).

It is important to mention that the 5,237 schools with students from 1st and 2nd cycles are represented in both groups. We must also remark that, amongst these two groups of schools, we excluded primary schools with high school students, given that the PDDE budget in this period is according to the number of primary students. Therefore, we kept only schools for which the autonomous budget is designed for their total number of students. This meant a reduction of 13% and 48% in the 1st cycle and 2nd cycle samples, respectively.



### 2.2.2
### School outcomes and school infrastructure characteristics

As student performance, we consider student test scores of Portuguese and Math in *Prova Brasil* at the school level, but also dropout and passing rates.

To evaluate school infrastructure condition we consider data both from school censuses and *Prova Brasil´*s questionnaires. The advantage of *Prova Brasil* microdata is twofold. First, school infrastructure is described by three different perspectives: interviewer, principal and teachers. While the interviewer represents an impartial view about the school, the principal and teachers might have a better knowledge of school condition. Second, it is described the maintenance status of several infrastructure items. Hence, we are able to characterize infrastructure quality (and not only infrastructure quantity), which is especially relevant since the autonomous

budget is only auxiliary and most of it (80%) is destined for infrastructure preservation (only 20% remains for purchasing durable goods). Therefore, we have very detailed information for numerous infrastructure items and different points of view.

Both the interviewer and the principal are asked to classify infrastructure items in four categories: nonexistent, or in bad, regular or good conditions. The physical infrastructure items present in the interviewer questionnaire are roof, wall, floor, building entrance, schoolyard, hallway, classrooms, doors, windows, toilets, kitchen, plumbing installations and electrical installations; the equipment items are television, parabolic antenna, VHS, copy machine, mimeo, video projector, slide projector, printing machine, sound machine and computer; and the literature items are textbooks, literature books, magazines, newspapers and comic books. The principal is asked to describe sport court, laboratory, amphitheater, music room, and art room (physical infrastructure); and also computer for students, internet for students, computer for teachers, internet for teachers, computer for administrative staff, educative DVDs, leisure DVDs, copy machine, printing machine, slides projector, video projector, DVD player, TV, parabolic antenna, and sound machine (equipment items).

Table 2.2 provides an overview of school infrastructure circumstances in 2007. According to interviewer perspective (Panel A), parabolic antenna, copy machine, video and slide projectors are the most missing devices at school; and sound machine, mimeo and parabolic antenna are the ones most needing repairs to achieve good conditions. Regarding the physical infrastructure, the problem reported by the interviewer is more related to maintenance than to nonexistence. There is room for quality improvement in all items, but especially on toilets, plumbing and electrical installations. For instance, approximately 20% of primary schools have toilets in bad conditions.

The principal perception (Table 2.2, Panel B) corroborates the interviewer view that the most absent equipment at school are parabolic antenna, copy machine, slides and video projector, but it is also included in the list computer for students and teachers. Parabolic antenna, sound machine, and computers for teachers are examples

of materials most needing upgrade on the principal opinion. The physical infrastructure items described by the principal are very different from the ones in the interviewer survey as they are more related to rooms with specific functions such as library or music room. Not surprisingly, several schools do not have these items. The situation is worse for the 1st cycle schools. Among these, 28% do not have a library and 44% do not have a sport court. However, there is also the need for improving the existing items if we note that 13% of 1st cycle schools and 18% of 2nd cycle school have a sport court in bad conditions.

Based on this information, we construct a quality index for each infrastructure item that assumes the values of zero, 0.33, 0.66 or 1 corresponding to the four categories given in the item description. The lowest value corresponds to absence and the highest to good functioning.

Even though, principal and interviewer may have different perspectives when evaluating school infrastructure, their view might not be systematically conflicting unless there is measurement error. In order to check for measurement errors we may investigate correlation among principal and interviewer indicators. Considering 1st cycle schools, the correlation indices are 0.66, 0.75, 0.54 and 0.56 for parabolic antenna, copy machine, printing machine and sound machine, correspondingly. These numbers are similar for 2nd cycle schools (0.62, 0.74, 0.42 and 0.52) and they imply that principal and interviewer have compatible views.

Additionally, the interviewer survey includes questions about the presence of damage and graffiti at school. Analyzing Table 2.3 (Panel A), we see that the majority of schools have no signals of destruction according to the six questions on this issue. For each item asked, we create an index where zero denotes the presence of damage/graffiti and one is the lack of these.

The infrastructure questions for the teachers are different. They are related only to school materials and the teachers must declare whether they did not use a particular item because the school did not have it. The equipment items considered are computer, internet, slide projector and copy machine; and the literature items are DVDs, magazines & newspapers, general books, literature books and textbooks. Therefore, the infrastructure indices for the teacher reflect simultaneously the

existence and the good functioning of certain infrastructure feature at school. Since more than one teacher for each school participates in the survey, we aggregate teacher answers at the school level so that the indices indicate the proportion of teachers that do not declare having shortage of a needed item at school. Hence, as in the previous indices, while one has a positive meaning, zero has a negative sense. If a certain item has an index of one, this means that all teachers answering the survey declared either that they used it or they did not need to use it.

Table 2.3 (Panel B) shows that, for most items, shortage of items at school did not prevent teachers from using it, except for literature books, textbooks, internet and computer. On average, 54% of teachers at each 1st cycle primary school declared that either used textbooks or not desired to use it, which implies that 46% of teachers at school affirmed not using it because of unavailability at school.

Even though the teacher questionnaire is different from the principal and interviewer, we also investigated how correlated are teacher indicators with the others. For instance, considering 1st cycle indicators for copy machine, the correlation is 0.57 with both principal and interviewer indicators (for 2nd cycle schools, these numbers are 0.56 and 0.55). The positive correlation between teacher, principal and interviewer indicators suggests that measurement error should be a minor issue.

In addition to *Prova Brasil* data, we also used information on infrastructure contained in the School Census. We consider the equipment variables reflecting the availability or the quantity of that item at school. Table 2.4 reports that most missing items at school are parabolic antenna and copy machine. This information is in accordance with that previously reported using *Prova Brasil*. The additional information is the number of computers owned. On average, there are 7 and 10 computers in 1st and 2nd cycle schools and most of computers are for student use. The student-computer ratio between computers for students and the number of students is very low, approximately 0.015.

The School Census also provides us with many schools characteristics that we consider as controls in our study, such as school region, number of students, percentage of teachers with higher education degree, percentage of teacher with

postgraduate degree, percentage of female teachers, student-teacher ratio, and percentage of female students.

From student microdata in *Prova Brasil*, we construct a simple index to indicate student socioeconomic level. Based on student answers indicating which assets are present at their household, we sum one if the item is owned and zero otherwise. This student index varies from zero to eight since eight items are considered (TV, radio, DVD payer, refrigerator, freezer, washing machine, car, computer and internet). Then the socioeconomic index is averaged at the school level. Table 2.5 presents summary statistics for these variables, which we will analyze in the next section.

Without taking into consideration the computer quantity indicators from School Census, there are 71 school infrastructure indices being analyzed. Following Kling, Liebman and Katz (2007), we construct aggregate indicators for each domain of infrastructure (physical infrastructure, equipment infrastructure and literature) and for each survey (interviewer, principal and teachers from *Prova Brasil* microdata; and School Census). Since we are interested in many outcome variables, aggregation helps to identify effects in the same direction without arbitrarily picking one positive result as the main one.

The aggregate indicator is the mean of the individual infrastructures indicators transformed in z-scores. To become a z-score, each infrastructure indicator was subtracted by the sample mean and divided by the sample standard deviation. Hence, each aggregate indicator is in terms of standard deviations of the sample.

We also investigated the correlation between aggregate indicators. The correlation indices between the interviewer equipment index with the correspondingly principal and teacher indicators are 0.67 and 0.46 for 1$^{st}$ cycle schools, as well as 0.59 and 0.37 for 2$^{nd}$ cycle schools. Again the positive correlation suggests no problems with measurement errors. The correlation between the physical infrastructure indicators from principal and interviewer is smaller (indices are 0.17 and 0.26 for 1$^{st}$ and 2$^{nd}$ cycles). But this is not a surprise since interviewer questionnaires considers overall physical infrastructure (plumbing installations, doors,…) and principal questionnaire is about functional facilities (library, sport court,…).

## 2.3
## Empirical Framework

### 2.3.1
### Identification Strategy and Estimation

According to PDDE rules, schools that achieve their quality index (IDEB) are awarded with additional resources to be locally managed. This feature of the program provides us a regression discontinuity design to be explored as an opportunity to evaluate the effect of more resources in a context of school-based management. By comparing schools which barely accomplished their goal with those that almost achieved it, it is possible to understand the effects of more autonomous funding. If schools are unable to precisely control their target achievement, the idea is that these two groups of schools have similar characteristics and, thus, are comparable.

Consider $Z_i^{07}$ as being the school score in 2007 minus the school target set for 2007[4]. If the school obtained $Z_i^{07} \geq 0$, then it received 50% more as additional autonomous funding in 2008 and 2009; however, if $Z_i^{07} < 0$, the school received only the conventional autonomous budget. Schools for which $Z_i^{07}$ is close enough to the zero threshold should be similar in terms of their observed and unobserved characteristics and, therefore, comparable.

Our paper investigates whether additional autonomous spending is related to better school outcomes. Since the treatment is the amount of resources received by the school council, which is a continuous variable, we run a fuzzy regression discontinuity model (Lee and Lemieux, 2010) for schools´ outcomes:

$$Y_i^{09} = \beta_0 + \beta_1 PDDE_i^{08-09} + f\left(Z_i^{07}\right) + \varepsilon_i \qquad (2.1)$$

Where $Y_i^{09}$ is the school $i$´s outcome in 2009; $PDDE_i^{08-09}$ is the school $i$´s PDDE transfer received in 2008 and 2009; and $f\left(Z_i^{07}\right)$ is a continuous function of the

[4] The forcing variable is the IDEB score minus IDEB target minus 0.05 because of rounding reasons.

forcing variable of school $i$. The dummy variable $D_i = I[Z_i^{07} \geq 0]$ is used as an instrument for the endogenous variable$PDDE_i^{08-09}$.

Because there are different targets set for the first and the second primary schools, this regression is run separately for each cycle.

In order to reduce bias, it is important to choose a polynomial function that approximates $f(.)$ to the real one the closest possible. As suggested by Lee and Lemieux (2010), we tried different polynomials orders to check whether results are dependent on the choice of $f(.)$. We also consider local linear regression for different bandwidths to verify the robustness of the results. Our option was to use rectangular kernel in the local estimations, and we used the optimal bandwidth proposed by Imbens and Kalyanaraman (2012), which is our preferred specification.

This approach has also some drawbacks. Besides receiving more funding, accomplishing quality target might mean other changes in school dynamics. For instance, at schools that almost achieved their goals, principals may get motivated and adopt actions to improve school quality in order to succeed next time. Thus, the effect of more resources for schools that accomplished their target would not become visible. Another caveat is that schools that succeed to achieve their target might attract students from families with a stronger taste for education. This would inflate the estimated of extra resources since this families would be more efficient on resource allocation at school. We further address these issues and investigate whether these confounding are operating.



### 2.3.2
### RDD Validity

It is a concern the fact that schools may manipulate their target achievement. Since the quality index is composed of pass rate and test score, we may argue that schools do not have incentive to boost pass rate because bad students would lower test scores. In addition, holding back bad students so that they do not take exams would decrease pass rates. The fraction of schools that achieved their quality target was large: 77% amongst the first cycle schools and 80% in the 2nd cycle schools. To

assess whether schools are really unable to manipulate their quality scores and precisely determine their target attainment, we look for a discontinuity at the cutoff on the density of the forcing variable. The presence of a discontinuity around the threshold of the forcing variable is an indication of precise control of the target accomplishment. For instance, if schools could control their quality indices and determine whether they achieve their target, then the density of the forcing variable would be very low just below the cutoff and very high just above the cutoff. Nonetheless, this discontinuity does not appear in Figures 2.1 and 2.2 that plot the density of the forcing variables.

Another way of testing whether there is sorting of schools at the cutoff is to verify that baseline characteristics are similar. If achieving or not quality target was essentially random among schools close to the cutoff, then their characteristics should be balanced. One might be worried that schools which achieve their target have different characteristics than those that failed to accomplish it. For instance, successful schools may be those with previous best quality or those with easiest targets. In addition, because small schools are more subject to error measures, they won´t be able to achieve their 2007 target if they scored high in 2005 by error. Nonetheless, having different characteristics is not a problem as long as schools around the cutoff have similar characteristics.

Table 2.5 presents evidence that the closer the schools are to the cutoff, the more similar they are. Previous school quality measured by 2005 IDEB and the effort required for school to achieve 2007 IDEB target (measured as ($target^{2007}$-$IDEB^{2005}$)/$IDEB^{2005}$) are not different for schools near the cutoff. Moreover, several schools characteristics are considered, such as teacher education, teacher-student ratio, student socioeconomic level, number of students, presence of an experienced principal (with more than 5 years' experience of management), better educated mothers (more than 50% of mothers have at least complete primary education) and higher community engagement (Parent Teacher Association with more than 3 meetings a year and community organizing activities at school). Overall, schools close to the cutoff are comparable.

In general, 1st cycle schools around the cutoff scored 3.9 in 2005 IDEB (which varies from zero to ten), and they had to improve their score in at least 2% in order to achieve their 2007 target. Almost 80% of these schools are under municipal control and they have, on average, 550 pupils and 71% of their teachers with higher education degree. The 2005 IDEB for 2nd cycle schools close to the cutoff is 3.4 and their minimum effort required to achieve 2007 target was, on average, 1.2%. Less than 70% of these schools are controlled by municipal secretariats, their size is around 730 students and more than 80% of their teachers have completed higher education.

Before proceeding with the outcome analysis, it is important to verify whether the rule is being respected and schools that achieve their quality index receive more funding. Figures 2.3 and 2.4 show the distribution of the grant provided by the *Dinheiro Direto na Escola* Program. It is possible to note that there is a discontinuity in the distribution of the school autonomous budget at the cutoff value of the forcing variable in both graphs. Therefore, reaching IDEB target in 2007 implies a discontinuous increase of PDDE transfers for the period 2008-2009. This same pattern is also obtained in the regression results reported in Table 2.6. Considering different specifications, the estimates indicate that the accomplishment of the 2007´s quality target implied an increase higher than R$4,000 ($2,000) and R$3,300 (U$1,650) for 1st cycle and 2nd cycle schools, correspondingly, during the period 2008-09.

## 2.4
## Results

Here we present the estimated effect of increasing autonomous budget on schooling outcomes[5]. Initially we discuss results for the final objective which is student learning. Then we discuss the possible mechanisms through which more resources might operate. These channels are higher parent participation and better school infrastructure. More resources to school committee might motivate or

[5] In our specifications we considered the total transfers received in 2008-2009 divided by $10^4$.

empower parents to be more engaged at school, thus affecting school quality and student achievement. Additionally, extra funding to community management may translate into more productive school inputs, enhancing infrastructure and student accomplishment. After that, we consider some robustness checks to our identification strategy, followed by an investigation of heterogeneous effects due to local characteristics.

Our tables present results for quadratic and cubic specifications using all sample and also local linear regression (rectangular kernel) for the 0.50 bandwidth around the cutoff and for the optimal bandwidth proposed by Imbens and Kalyanaraman (2012) (From now on, I-K bandwidth). We opted to show the results controlling for schools characteristic variables, which reduce the estimated variance without changing the outcomes. The variables included were regional dummies, number of students, municipal status, percentage of teachers with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index.



### 2.4.1
### Effect on student performance

Considering that school community is interested in improving learning and knows school needs better, we expect this extra funding to be allocated in a productive way with potential to enhance student performance. In addition, extra resources could encourage parent participation at school with positive influence on student learning. Nevertheless, Table 2.7 shows that more autonomous resource in 2008-2009 had no significant effect on student performance in 2009, measured as test scores, passing rate and dropout rate.

This finding could be explained if extra resources do not enhance parent participation at school or do not result on better school infrastructure. Nonetheless, it could be that parent engagement at school and infrastructure do not so easily or so fast translate into learning improvements. Therefore, local decision makers could be

employing resources in a productive way without immediate impact on achievement. However, even with a school council managing resources, it is also possible that autonomous resources are being captured locally without enhancing school infrastructure and learning materials. Some local characteristics might favor the use of resources to benefit school quality and student learning.

Next, we investigate if extra resources encouraged parent participation at school as well as the allocation of these resources. We also look for heterogeneous effects in different local settings.

### 2.4.2
### Effect on community participation at school



Firstly, we investigate whether an increase of resources managed by the school committee encouraged community participation at school in different ways. More resources under school council control could mean more empowerment to parents. They might be encouraged to participate in other dimensions at school.

Several aspects were considered: active Parent Teacher Association (which is the one with more than 3 meetings a year); more than 3 parent-teacher meetings a year; community support to principal; community working for school maintenance; and community organized activities, events or aid campaigns. Nevertheless, no evidence is found, as seen in Table 2.8, that school community became more participative. This constitutes evidence that extra resources under school council control do not translate into more community participation at school. Therefore, one of the mechanisms through which more autonomous resources could affect student performance is not operating. Then, we investigate whether increasing local managed budget enhance school infrastructure.

### 2.4.3
### Effect on infrastructure

Before investigating infrastructure improvements, we will consider how extra resources affected principal and teachers perceptions of budget. In Table 2.9, we see that teachers in the 1st cycle schools felt an improvement on the monetary resources availability (an increase of R$10,000 implied an improvement of approximately 0.3 s.d. on teacher perception). But, for 2nd cycle schools, it is not found a significant effect robust to different specifications.

We expect the extra resources to improve school infrastructure and materials and we investigate how school community allocated the additional funding. Table 2.10 reports the effects on aggregate indices of infrastructure quality, for both cycles of primary education.

Initially, we consider the results for the 1st cycle schools. There is some evidence of upgrading on equipment, according to the interviewer and teachers perspectives (Panels A and C). Considering the interviewer view and the I-K bandwidth specification (Panel A, column 5), an increase of one standard deviation on the autonomous budget (approximately R$7,700, according to Table 2.1) would lead to an improvement of 0.09 standard deviation on the equipment index, which is a small effect. However, no change is suggested on the equipment quality by the census variables (Panel D) and the significant effect on the equipment index according to the principal view is not robust to all specifications.

Surprisingly, the interviewer perspective suggests a significant negative change on the physical infrastructure quality (Panel A), but the magnitude is not large (one standard deviation upgrade in the autonomous budget would decrease 0.15 standard deviation in the physical infrastructure item (Panel A, column 5).

No significant effects were found on the literature indices (Panels A and C) nor on the existence of damage/graffiti at school (Panel A). In terms of computer quantity, no significant effect was found (Panel D).

Since we have many infrastructure variables; the use of aggregate indices is helpful to identify general impacts without electing few results as the main ones.

Nonetheless, we are also interested in knowing more precisely which infrastructure items are driving the results. Therefore, we also present results individually for infrastructure items. Table 2.11 present some results for the individual indices transformed in z-scores (the remaining items are reported in Table A.2.1, in the Appendix).

In Table 2.11, Panel A, we present the individual infrastructure items according to the interviewer survey. The negative change we previously observed on the physical infrastructure index of the 1st cycle schools is being driven by variations on the roof, toilets and plumbing installations. The improvement on the equipment index is coming from significant effect on the computer quality.

Panel B (Table 2.11) reports results according to the principal perspective. For the 1st cycle schools, there are significant upgrades on the teacher and staff computers and the teacher internet, but no significant effect is found on student computers and internet. There is an improvement of almost 0.2 s.d. in the computers for teachers and 0.24 s.d. in the internet for teachers if the autonomous budget is increased by one s.d. (I-K bandwidth specification). Panel C (Table 2.11) shows that the teacher opinion and the principal view converge. Teachers also consider that their internet and computer presented significant improvements (though the positive effect on computer is not robust for I-K bandwidth).

In sum, our findings constitute evidence that the 1st cycle schools with additional resources chose to invest mostly on equipment quality, especially on computers and internet for teachers. This result is in accordance with the previous finding that teacher felt an improvement on the availability of monetary resources (Table 2.9).

Considering 2nd cycle schools, there are no significant effects on the aggregate infrastructure indices (Table 2.10). Analyzing the individual indices, it is observed only a significant positive effect on parabolic antenna quality according to the interviewer view (Table 2.11, Panel A). Therefore, the additional resources do not seem to be as productive in the 2nd cycle schools as they are on the 1st cycle schools.

### 2.4.4
### Robustness checks

In order to corroborate the previous outcomes, we should find no effect on pre-treatment outcome variables. As a falsification test, Table 2.12 reports the results for 2007´s infrastructure indicators. Except for a few coefficients that were significant, no robust effect is found in Table 2.9, as expected.

One caveat is related to the fact that achieving or not IDEB target could be a school feature affecting school student composition. Student sorting among schools could be driven by school performance on target accomplishment if this attribute attracts student with certain characteristics. For instance, students more concerned about school quality could prefer schools that achieved their target. Nonetheless, if education preferences and socioeconomic level are positively correlated and if there is self-selection, then we expect to see that student socioeconomic level in 2009 change discontinuously at the cutoff of the running variable. One possible way to investigate if sorting is happening is to evaluate whether there is some effect of the additional resources on student characteristics. Yet Table 2.13 reports no impact on student socioeconomic level in 2009. This indicates that student socioeconomic level is similar for schools close to the cutoff; so it seems that student sorting is not an issue.

Another possible threat is that achieving or not the quality target could change the school motivation so that schools would adopt different strategies depending on its target attainment. Schools closer to their target could be more motivated to achieve their next target and invest more on infrastructure and other dimensions. Actually, even states and municipalities concerned about achieving their IDEB targets could be interested in investing more on schools that did not achieve their quality threshold, especially those that were closer to it. These investments made by these federal entities and by school themselves could confound the identification of the effect of additional autonomous funding received by schools that achieved their quality target.

On the other hand, there is no reason to think that these “confounding” investments would be restricted to infrastructure. For instance, more teachers with

higher qualification could be hired. Therefore, a discontinuity on these teacher characteristics in 2009 at the threshold implies that these "confounding" effects are operating. In order to test this hypothesis, we investigate whether the additional resources had impact on student-teacher ratio or teachers characteristics. Since the PDDE funding is not allowed to be spent with wages or teacher training, there should be no impact on these variables. Therefore, if there are significant changes on these variables, it would be implied that other "confounding" effects exist. However, Table 2.13 presents no robust significant change of student-teacher ratio or percentage of teachers with higher education degree.

### 2.4.5
### Do different local settings matter? Mother education and previous community engagement

As previously discussed, school-based managements reforms outcomes might depend on the characteristics of local community. The additional funding provided to school committees might have diverse effects depending on the local contexts. Therefore, we will investigate the effects of extra resources, locally managed, in different local settings by considering the local characteristics in the pre-treatment period (2007). And as we can see in Table 2.5, these local institutional features do not discontinuously change at the cutoff.

To take into account local community human capital, we consider schools where more than 50% of the mothers have at least complete primary education. These characteristics might represent local community ability to manage resources and also to have real authority.

To explore parent engagement at school, we study separately schools where parent teacher association (PTA) holds meetings at least three times a year and where parents organize community activities at school. We consider that these local characteristics favor accountability and might benefit other school autonomy reforms.

Therefore, our hypothesis is that the extra funding would promote more improvements in schools where local community has more human capital or in schools with an active PTA.

Table 2.14 reports differentiated effects according to the mother level of education in 1st cycle primary schools. More educated mothers promote more benefits for equipment quality, according to the interviewer, principal and teacher view (Panels A, B and C). In addition, schools where more than 50% of the mothers have the complete primary education, extra resources also increase the number of student computers as reported in the School Census (Panel D). Increasing local budget by one standard deviation (R$7,700) results in an upgrade of 0.1 s.d. in equipment quality (Panel A, column 9) and an increase of 2 computers for student use (Panel D, column 9).

When we consider the effects on the detailed items (Table 2.16), we note that the interviewer reports a significant positive effect on TV and computer quality. An improvement of 0.24 s.d. on computer quality is observed under a scenario of increasing one s.d. of school committee budget (Panel A, column 9). According to the principal opinion (Panel B), there is a significant effect on teacher computers and internet but not on student computers.

In sum, the results suggest that the 1st cycle primary schools where mothers are more educated experience higher levels of improvement on equipment quality than school with less educated mothers. More specifically, these schools seem to use resources towards not only teacher computers and internet but also student computers.

Regarding 2nd cycle schools, there is no significant improvement on infrastructure quality neither on schools with less educated mothers nor on those with less educated mothers (Table 2.15). Once again, this is some evidence that extra resources are not as productive on these schools as on 1st cycle schools.

The effect of additional locally managed resources on school infrastructure, according to community engagement, is reported in Table 2.17. In the 1st cycle schools, a rise of one s.d. of school committee budget increases physical infrastructure quality by 0.14 s.d., according to principal perception (Table 2.17,

Panel B, column 9), and adds 2,28 computers for student use (Table 2.17, Panel D, column 9) in the schools where community is more participative. Regarding schools where community is less participative, we see that teachers report a significant improvement on the equipment they use.

In Table 2.19, we see that principals of schools with a less engaged community report a significant enhancement of computers and internet for teachers. The findings of Table 2.17 and 2.19 indicate that if local community is more present at school, then local resources are invested for student use; if the opposite is true, local resources are allocated for teachers use.

Contrary to the effects on the 1st cycle schools, we observe no significant improvement on infrastructure quality of 2nd cycle schools even considering if school community is more or less engaged (Table 2.18). It seem that 2nd cycle school dynamics are very different from 1st cycle.

We also examined whether these local characteristics affect the previous findings obtained for student performance. However, local context do not change the null result. Results are reported in Tables A.2.2 and A.2.3 on the appendix.

## 2.5
## Discussion

In this chapter, we investigate whether an increase of resources controlled by local community resulted in better education quality. Despite not being a very large amount, more resources could contribute to empower community and encourage parent participation in other school aspects. In addition, these resources had the potential to be allocated in a very productive way due to incentives present in this decentralized context.

Our results suggest no increase on parent level of participation at school. In addition, no effects were found on student performance, considered as test scores and pass/dropout rates. We then investigated how resources were allocated. A marginal increase in the equipment index was found, but not on the physical infrastructure index. By disaggregating the indices, there was some evidence of investment on

computers (especially teacher computers on the principal perspective). Since we are using very detailed information on physical infrastructure as well as on equipment quality, these findings suggest that school council prefer to spend on equipment rather than physical infrastructure. Nonetheless, the option for equipment may imply upgrading on goods that do not directly benefit students. For instance, computers for teachers may affect students depending on how teachers use it.

We also investigated whether local characteristics modify the effects of increasing funding under school council control. Mother education and previous community engagement were the local characteristics considered in this analysis. Schools where mothers are more educated had more significant improvement on equipment quality than schools with less educated mothers. In addition, these schools had improvements not only on computers for teachers but also on computers for students.

The results for schools with previous more community engagement were also different from the ones for school where this engagement was modest. In the first group of schools, there was a slight improvement on physical infrastructure (principal opinion) and an increase on computers for students, while the second group experienced an enhancement on computers for teachers.

These findings suggest that better educated mothers and an engaged community might influence the use of resources towards direct benefit of students. In these contexts, investments were made on infrastructure quality with a direct impact on student welfare (since computers for student or physical infrastructure directly benefit students).

Therefore, we found evidence that local settings might influence outcomes in a decentralized context. More educated and engaged community might change outcomes both quantitatively and qualitatively. Not only positive outcomes may be enhanced, but also these outcomes might represent a more direct welfare increase for this community.

In any case, we found no heterogeneous effects on student performance, considering local characteristics. That is, even when funding directly benefit students, student performance did not improve.

We must note that these results are mainly for 1st cycle primary schools. Overall, no systematic or sizeable effect was obtained for 2nd cycle schools. It seems that 2nd cycle schools have different dynamics compared to 1st cycle ones.

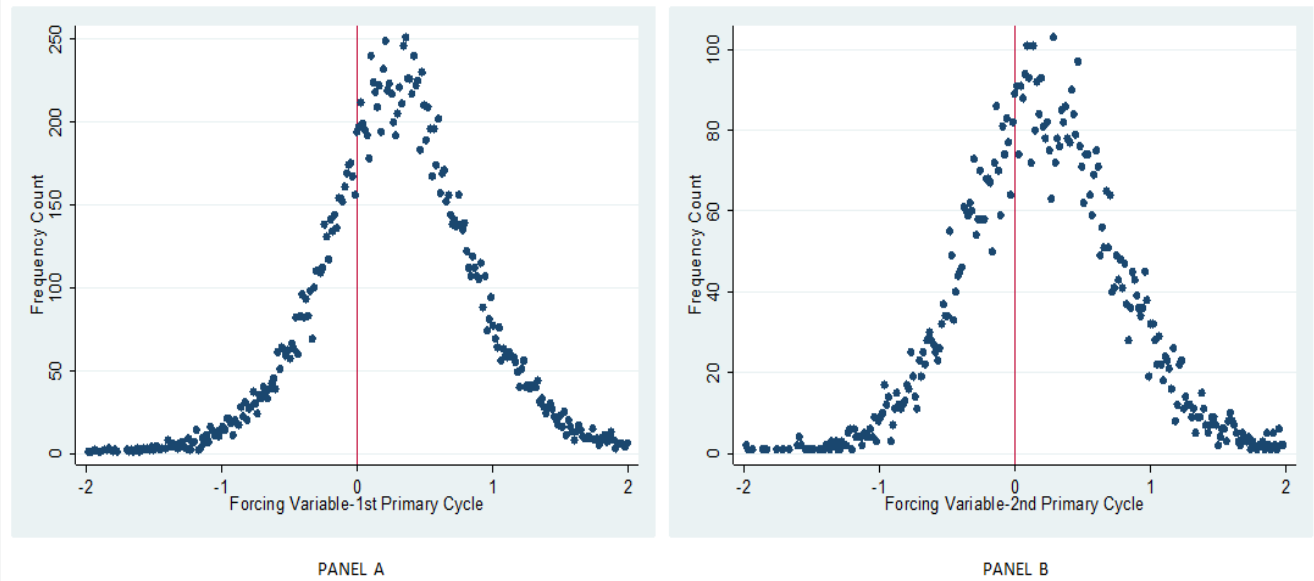


**Figure 2.1: Distribution of the forcing variables**

Notes: The scatter plots represent the density of the forcing variables for 1st cycle (Panel A) and 2nd cycle (Panel B) schools. The forcing variable correspond to the difference between the quality index achieved in 2007 and the target established by the National Government. The vertical line is on the zero value. It was considered a bin size of 0.015.

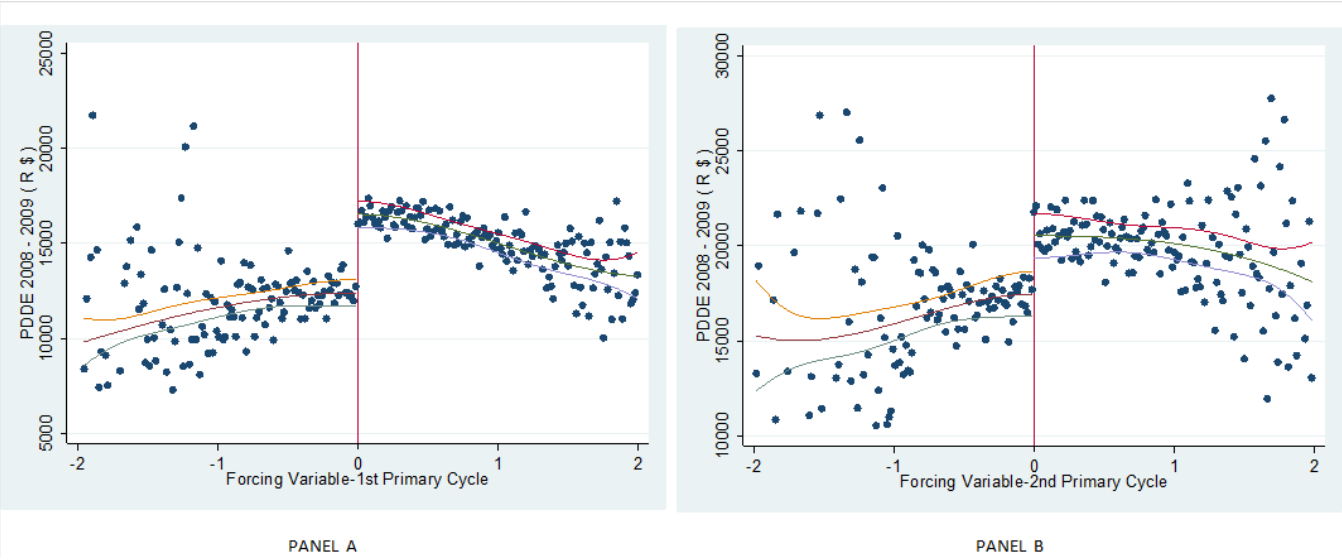


**Figure 2.2: Total autonomous budget, 2008-09**

Notes: The scatter plots in Panel A and B depicts the relationship between the total amount received by schools from the Brazilian school autonomy program (PDDE) in 2008-09 and the forcing variables for both primary cycles. The forcing variable correspond to the difference between the quality index achieved in 2007 and the target established by the National Government. The vertical line is on the zero value of the forcing variable. It was considered a bin size of 0.015.

**Table 2.1: 2008-2009 PDDE transfers (primary urban schools)**

| | median | mean | sd | obs |
|---|---|---|---|---|
| 1st Cycle Schools | | | | |
| Total | R$ 12,908.25 | R$ 14,836.04 | 7731.24 | 19182 |
| Total/student | R$ 30.35 | R$ 32.39 | 10.72 | 19182 |
| Bonus | R$ 4,522 | R$ 5,198 | 2589.01 | 14758 |
| Bonus/student | R$ 10.39 | R$ 11.08 | 3.15 | 14758 |
| 2nd Cycle schools | | | | |
| Total | R$ 17,580.90 | R$ 19,192.26 | 8733.59 | 7920 |
| Total/student | R$ 28.00 | R$ 29.71 | 8.63 | 7920 |
| Bonus | R$ 6,404 | R$ 6,702 | 2866.25 | 6370 |
| Bonus/student | R$ 9.64 | R$ 10.21 | 2.49 | 6370 |

Notes: This table reports descriptive statistics on the total transfers provided by PDDE (the Brazilian school autonomy program) during 2008-2009 period.

**Table 2.2: Infrastructure according to interviewer and principal surveys, 2007**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nonexistent (%) | Bad (%) | Regular (%) | Good (%) | obs | Nonexistent (%) | Bad (%) | Regular (%) | Good (%) | obs |
| Panel A: Interviewer´s view: | | | | | | | | | | |
| **television** | 1.59 | 2.70 | 11.78 | 83.93 | 18708 | 0.98 | 2.07 | 13.16 | 83.80 | 7685 |
| **parabolic antenna** | 41.92 | 17.56 | 11.32 | 29.20 | 18115 | 38.52 | 18.34 | 11.95 | 31.19 | 7438 |
| **VHS** | 12.71 | 10.70 | 15.08 | 61.51 | 18464 | 10.13 | 10.81 | 17.09 | 61.97 | 7594 |
| **copy machine** | 50.13 | 3.94 | 7.67 | 38.26 | 18034 | 43.03 | 4.88 | 9.46 | 42.64 | 7456 |
| **mimeo** | 4.64 | 12.27 | 28.46 | 54.63 | 18579 | 8.09 | 12.82 | 27.51 | 51.58 | 7612 |
| **video projector** | 76.10 | 1.96 | 3.48 | 18.45 | 17596 | 69.00 | 2.94 | 4.68 | 23.38 | 7244 |
| **slide projector** | 32.76 | 3.35 | 7.90 | 55.99 | 18154 | 16.89 | 4.75 | 11.77 | 66.59 | 7542 |
| **printing machine** | 11.39 | 3.10 | 12.92 | 72.59 | 18481 | 5.34 | 3.31 | 14.33 | 77.02 | 7605 |
| **sound machine** | 4.37 | 6.17 | 19.49 | 69.96 | 18608 | 3.72 | 6.55 | 20.50 | 69.23 | 7654 |
| **computer** | 8.50 | 3.67 | 17.50 | 70.33 | 18536 | 3.20 | 3.64 | 19.09 | 74.07 | 7633 |
| **Roof** | 0.15 | 10.45 | 30.38 | 59.02 | 18766 | 0.14 | 10.67 | 30.67 | 58.51 | 7694 |
| **Wall** | 0.06 | 5.85 | 30.20 | 63.89 | 18804 | 0.01 | 5.81 | 31.74 | 62.44 | 7716 |
| **Floor** | 0.21 | 11.16 | 30.54 | 58.08 | 18804 | 0.21 | 11.09 | 30.17 | 58.53 | 7717 |
| **Building entrance** | 0.25 | 7.04 | 26.35 | 66.37 | 18768 | 0.10 | 6.50 | 25.59 | 67.80 | 7706 |
| **Schoolyard** | 4.42 | 11.49 | 29.31 | 54.79 | 18734 | 3.09 | 11.64 | 28.76 | 56.51 | 7692 |
| **Hallway** | 4.88 | 6.05 | 24.15 | 64.91 | 18268 | 2.42 | 5.99 | 26.24 | 65.35 | 7515 |
| **Classrooms** | 0.05 | 5.77 | 32.05 | 62.13 | 18294 | 0.08 | 6.05 | 35.11 | 58.76 | 7519 |
| **Doors** | 0.42 | 10.30 | 35.47 | 53.81 | 18789 | 0.53 | 12.59 | 38.14 | 48.74 | 7714 |
| **Windows** | 2.94 | 10.48 | 27.32 | 59.25 | 18764 | 2.82 | 11.22 | 30.81 | 55.15 | 7695 |
| **Toilets** | 0.17 | 19.03 | 35.61 | 45.19 | 18694 | 0.14 | 20.22 | 37.21 | 42.43 | 7662 |
| **Kitchen** | 0.47 | 12.93 | 28.51 | 58.10 | 18674 | 0.44 | 12.30 | 28.44 | 58.81 | 7657 |
| **Plumbing installations** | 0.55 | 14.18 | 35.60 | 49.67 | 18681 | 0.38 | 15.39 | 36.62 | 47.62 | 7674 |
| **Electrical installations** | 0.15 | 14.30 | 33.67 | 51.88 | 18733 | 0.09 | 16.13 | 34.86 | 48.93 | 7683 |
| **textbooks** | 2.81 | 2.21 | 24.04 | 70.94 | 17573 | 1.35 | 4.22 | 30.80 | 63.63 | 7402 |
| **literature books** | 5.93 | 1.82 | 20.13 | 72.12 | 17503 | 2.16 | 1.50 | 19.25 | 77.09 | 7406 |
| **magzines** | 34.08 | 3.21 | 17.72 | 44.99 | 17392 | 29.94 | 4.36 | 20.84 | 44.85 | 7355 |
| **newspapers** | 42.24 | 2.88 | 14.46 | 40.42 | 17305 | 39.09 | 3.58 | 15.71 | 41.62 | 7326 |
| **comics** | 39.27 | 5.09 | 21.59 | 34.05 | 17296 | 40.35 | 5.79 | 21.77 | 32.08 | 7325 |
| Panel B: Principal´s view: | | | | | | | | | | |
| **computer for students** | 54.44 | 4.39 | 11.49 | 29.68 | 18449 | 41.96 | 6.23 | 15.33 | 36.47 | 7559 |
| **internet for students** | 70.13 | 2.56 | 7.61 | 19.71 | 18432 | 57.11 | 4.22 | 11.02 | 27.65 | 7558 |
| **computer for teachers** | 40.57 | 5.70 | 17.81 | 35.92 | 18446 | 30.10 | 7.45 | 21.38 | 41.06 | 7557 |
| **internet for teachers** | 56.52 | 3.63 | 11.85 | 27.99 | 18440 | 45.53 | 4.99 | 14.81 | 34.67 | 7542 |
| **computer for adm staff** | 13.60 | 4.44 | 19.24 | 62.72 | 18465 | 7.82 | 4.38 | 20.74 | 67.05 | 7555 |
| **educative DVDs** | 5.24 | 2.07 | 15.84 | 76.85 | 18478 | 3.66 | 2.53 | 17.72 | 76.09 | 7558 |
| **leisure DVDs** | 25.21 | 4.78 | 21.71 | 48.30 | 18424 | 27.82 | 5.91 | 22.97 | 43.29 | 7530 |
| **copy machine** | 50.18 | 4.23 | 9.31 | 36.29 | 18384 | 43.08 | 5.15 | 11.40 | 40.38 | 7519 |
| **printing machine** | 12.66 | 4.69 | 17.32 | 65.33 | 18449 | 6.55 | 5.09 | 19.71 | 68.66 | 7546 |
| **slides projector** | 32.11 | 3.37 | 8.51 | 56.01 | 18430 | 15.58 | 4.90 | 13.26 | 66.27 | 7556 |
| **video projector** | 81.21 | 2.21 | 3.02 | 13.56 | 18340 | 74.87 | 3.04 | 4.22 | 17.87 | 7509 |
| **DVD player** | 3.62 | 2.79 | 11.33 | 82.26 | 18417 | 2.65 | 3.02 | 13.12 | 81.20 | 7539 |
| **TV** | 1.56 | 2.89 | 12.24 | 83.31 | 18492 | 0.88 | 2.56 | 12.76 | 83.80 | 7578 |
| **parabolic antenna** | 40.51 | 20.52 | 11.51 | 27.46 | 18408 | 36.99 | 21.26 | 12.28 | 29.47 | 7526 |
| **sound machine** | 4.96 | 7.29 | 21.07 | 66.68 | 18452 | 4.42 | 7.44 | 22.52 | 65.63 | 7541 |
| **library** | 27.92 | 6.89 | 23.76 | 41.42 | 18449 | 14.48 | 7.88 | 26.65 | 50.98 | 7560 |
| **sport court** | 43.95 | 12.55 | 16.12 | 27.37 | 18427 | 28.21 | 18.16 | 20.28 | 33.35 | 7539 |
| **laboratory** | 83.44 | 2.11 | 4.62 | 9.84 | 18417 | 71.35 | 4.42 | 8.34 | 15.89 | 7515 |
| **amphitheater** | 85.06 | 1.47 | 4.20 | 9.27 | 18474 | 77.26 | 2.60 | 6.46 | 13.68 | 7552 |
| **music room** | 93.24 | 0.69 | 2.28 | 3.78 | 18426 | 91.17 | 1.06 | 3.03 | 4.74 | 7517 |
| **art room** | 91.24 | 0.77 | 2.71 | 5.28 | 18472 | 87.63 | 1.27 | 4.23 | 6.87 | 7550 |

Notes: This table reports descriptive statistics on the infrastructure variables as reported by interviewers and principals on 2007 Prova Brazil microdata.

**Table 2.3: Infrastructure according to principal and teacher surveys, 2007**

| | 1st cycle schools | | | 2nd cycle schools | | |
|---|---|---|---|---|---|---|
| | mean | sd | obs | mean | sd | obs |
| Panel A: Interviewer´s view: | | | | | | |
| **lack of damage** | 71.99 | 44.9 | 18693 | 65.04 | 47.69 | 7672 |
| **lack of internal graffiti** | 86.53 | 34.14 | 18655 | 76 | 42.71 | 7649 |
| **lack of external graffiti** | 79.28 | 40.53 | 18606 | 70.92 | 45.42 | 7630 |
| **lack of toilet damage** | 80.03 | 39.98 | 18567 | 69.21 | 46.17 | 7619 |
| **lack of internal damage** | 86.31 | 34.37 | 18610 | 78.5 | 41.09 | 7637 |
| **lack of external damage** | 84.65 | 36.05 | 18578 | 79.99 | 40.01 | 7617 |
| Panel B: Teacher´s view: | | | | | | |
| **computer** | 63.76 | 40.79 | 19001 | 67.87 | 36.88 | 7852 |
| **internet** | 45.44 | 43.06 | 19018 | 52.41 | 41.54 | 7853 |
| **slide projector** | 93.77 | 17.79 | 19068 | 92.18 | 16.68 | 7860 |
| **copy machine** | 94.23 | 15.33 | 19067 | 92.01 | 15.75 | 7860 |
| **DVD** | 96.78 | 11.65 | 19071 | 95.98 | 11.33 | 7861 |
| **magazines & newspapers** | 98.05 | 8.65 | 19072 | 96.72 | 10.07 | 7858 |
| **general books** | 98.72 | 6.87 | 19060 | 97.98 | 7.87 | 7856 |
| **literature books** | 57.87 | 42.22 | 19040 | 71.24 | 34.5 | 7852 |
| **textbooks** | 54.4 | 43.17 | 19043 | 60.77 | 39.63 | 7856 |

Notes: This table reports descriptive statistics on the infrastructure variables as reported by interviewers and teachers on 2007 Prova Brazil microdata. The interviewers described whether there is ot not that feature at school whereas the teachers declared whether each item was available for them to use at school.

**Table 2.4: Infrastructure characteristics on School Census, 2007**

| | 1st cycle schools | | | 2nd cycle schools | | |
|---|---|---|---|---|---|---|
| | mean | sd | obs | mean | sd | obs |
| VHS | 83.41 | 37.20 | 19182 | 88.59 | 31.80 | 7920 |
| DVD player | 88.18 | 32.29 | 19182 | 90.90 | 28.77 | 7920 |
| Parabolic antenna | 39.10 | 48.80 | 19182 | 42.13 | 49.38 | 7920 |
| Copy machine | 41.39 | 49.25 | 19182 | 49.89 | 50.00 | 7920 |
| Slide projector | 64.23 | 47.93 | 19182 | 81.35 | 38.95 | 7920 |
| Printing machine | 84.40 | 36.28 | 19182 | 91.65 | 27.66 | 7920 |
| Computers | 86.49 | 34.19 | 19182 | 92.06 | 27.04 | 7920 |
| # of computers | 7.13 | 8.76 | 19182 | 9.80 | 10.71 | 7920 |
| # of adm comp | 2.16 | 2.47 | 16959 | 2.92 | 3.17 | 6877 |
| # of student comp | 5.54 | 7.61 | 15774 | 7.74 | 8.47 | 6365 |
| comp/students | 0.015 | 0.021 | 19182 | 0.015 | 0.017 | 7920 |
| st.comp/students | 0.011 | 0.016 | 15774 | 0.012 | 0.014 | 6365 |

Notes: This table reports descriptive statistics on infrastructure variables from 2007 School Census.

## Table 2.5: School Characteristics (2007)

| | 1st Cycle Schools | | | | 2nd Cycle Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | | Bandwidth | | | | Bandwidth | | |
| | all | 0.5 | 0.25 | 0.15 | all | 0.5 | 0.25 | 0.15 |
| Panel A: Quality characteristics | | | | | | | | |
| **Previous School Quality (2005 IDEB)** | | | | | | | | |
| Nontreated mean | 4.044 | 4.003 | 3.945 | 3.946 | 3.590 | 3.521 | 3.490 | 3.444 |
| Treated mean | 3.669 | 3.852 | 3.911 | 3.914 | 3.201 | 3.347 | 3.374 | 3.409 |
| p-value | 0.000 | 0.000 | 0.133 | 0.258 | 0.000 | 0.000 | 0.000 | 0.378 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2812 | 2051 | 1176 | 752 |
| Treated observations | 13984 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Effort required to achieve 2007 target** | | | | | | | | |
| Nontreated mean | 0.020 | 0.020 | 0.021 | 0.020 | 0.011 | 0.012 | 0.012 | 0.012 |
| Treated mean | 0.026 | 0.020 | 0.020 | 0.020 | 0.016 | 0.013 | 0.013 | 0.012 |
| p-value | 0.000 | 0.199 | 0.207 | 0.726 | 0.000 | 0.004 | 0.452 | 0.939 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2812 | 2051 | 1176 | 752 |
| Treated observations | 13984 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| Panel B: Teacher and student characteristics | | | | | | | | |
| **Percentage of teachers with undergraduate degree** | | | | | | | | |
| Nontreated mean | 0.700 | 0.705 | 0.706 | 0.710 | 0.811 | 0.812 | 0.824 | 0.825 |
| Treated mean | 0.720 | 0.722 | 0.719 | 0.714 | 0.821 | 0.816 | 0.807 | 0.798 |
| p-value | 0.000 | 0.001 | 0.054 | 0.607 | 0.027 | 0.562 | 0.039 | 0.011 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2811 | 2050 | 1176 | 752 |
| Treated observations | 13983 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Percentage of teachers with graduate degree** | | | | | | | | |
| Nontreated mean | 0.193 | 0.196 | 0.194 | 0.199 | 0.232 | 0.239 | 0.249 | 0.248 |
| Treated mean | 0.222 | 0.216 | 0.209 | 0.202 | 0.255 | 0.250 | 0.240 | 0.244 |
| p-value | 0.000 | 0.000 | 0.013 | 0.624 | 0.000 | 0.113 | 0.327 | 0.759 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2811 | 2050 | 1176 | 752 |
| Treated observations | 13983 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Percentage of female teachers** | | | | | | | | |
| Nontreated mean | 0.891 | 0.892 | 0.892 | 0.891 | 0.811 | 0.807 | 0.809 | 0.807 |
| Treated mean | 0.896 | 0.895 | 0.897 | 0.896 | 0.811 | 0.808 | 0.808 | 0.811 |
| p-value | 0.004 | 0.089 | 0.083 | 0.139 | 0.863 | 0.740 | 0.950 | 0.558 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2811 | 2050 | 1176 | 752 |
| Treated observations | 13983 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Percentage of female students** | | | | | | | | |
| Nontreated mean | 0.479 | 0.480 | 0.480 | 0.480 | 0.490 | 0.490 | 0.490 | 0.490 |
| Treated mean | 0.480 | 0.480 | 0.481 | 0.480 | 0.492 | 0.492 | 0.492 | 0.491 |
| p-value | 0.278 | 0.469 | 0.514 | 0.938 | 0.035 | 0.048 | 0.087 | 0.348 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2812 | 2051 | 1176 | 752 |
| Treated observations | 13984 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Teacher-student ratio** | | | | | | | | |
| Nontreated mean | 0.041 | 0.041 | 0.041 | 0.041 | 0.043 | 0.043 | 0.043 | 0.043 |
| Treated mean | 0.042 | 0.041 | 0.041 | 0.041 | 0.044 | 0.044 | 0.043 | 0.044 |
| p-value | 0.005 | 0.076 | 0.199 | 0.804 | 0.007 | 0.034 | 0.120 | 0.041 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2811 | 2050 | 1176 | 752 |
| Treated observations | 13983 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Total of students** | | | | | | | | |
| Nontreated mean | 536 | 548 | 550 | 557 | 731 | 731 | 734 | 740 |
| Treated mean | 514 | 540 | 540 | 542 | 702 | 718 | 722 | 722 |
| p-value | 0.000 | 0.209 | 0.221 | 0.162 | 0.001 | 0.202 | 0.419 | 0.287 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2812 | 2051 | 1176 | 752 |
| Treated observations | 13984 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Socioeconomic Index** | | | | | | | | |
| Nontreated mean | 5.192 | 5.240 | 5.226 | 5.249 | 5.276 | 5.263 | 5.283 | 5.267 |
| Treated mean | 5.240 | 5.293 | 5.295 | 5.280 | 5.271 | 5.251 | 5.202 | 5.213 |
| p-value | 0.004 | 0.008 | 0.009 | 0.376 | 0.842 | 0.708 | 0.058 | 0.320 |
| Nontreated observations | 4897 | 3702 | 2375 | 1530 | 2797 | 2041 | 1170 | 750 |
| Treated observations | 13475 | 6919 | 3368 | 1958 | 5170 | 2833 | 1464 | 893 |

Notes: This table reports descriptive statistics on several school characteristics considering all sample but also subsamples around the zero value of the forcing variable for both primary cycles.

**Table 2.5: School Characteristics (2007) (continued)**

| | 1st Cycle Schools | | | | 2nd Cycle Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | | Bandwidth | | | | Bandwidth | | |
| | all | 0.5 | 0.25 | 0.15 | all | 0.5 | 0.25 | 0.15 |
| Panel C: Institutional characteristics | | | | | | | | |
| **Percentage of state level schools** | | | | | | | | |
| Nontreated mean | 0.221 | 0.210 | 0.208 | 0.201 | 0.328 | 0.315 | 0.317 | 0.313 |
| Treated mean | 0.200 | 0.201 | 0.202 | 0.205 | 0.325 | 0.336 | 0.327 | 0.325 |
| p-value | 0.001 | 0.257 | 0.568 | 0.769 | 0.788 | 0.126 | 0.601 | 0.595 |
| Nontreated observations | 5311 | 3937 | 2495 | 1614 | 2812 | 2051 | 1176 | 752 |
| Treated observations | 13984 | 7195 | 3525 | 2052 | 5219 | 2849 | 1469 | 896 |
| **Percentage of schools with an experienced principal** | | | | | | | | |
| Nontreated mean | 0.449 | 0.449 | 0.456 | 0.444 | 0.452 | 0.461 | 0.458 | 0.468 |
| Treated mean | 0.459 | 0.463 | 0.463 | 0.455 | 0.468 | 0.465 | 0.458 | 0.454 |
| p-value | 0.238 | 0.185 | 0.599 | 0.513 | 0.204 | 0.804 | 0.997 | 0.583 |
| Nontreated observations | 5120 | 3800 | 2407 | 1562 | 2657 | 1948 | 1119 | 718 |
| Treated observations | 13502 | 6923 | 3392 | 1970 | 5030 | 2741 | 1405 | 861 |
| **Percentage of schools with more educated mothers** | | | | | | | | |
| Nontreated mean | 0.494 | 0.510 | 0.518 | 0.523 | 0.478 | 0.480 | 0.495 | 0.490 |
| Treated mean | 0.510 | 0.522 | 0.522 | 0.523 | 0.492 | 0.479 | 0.473 | 0.471 |
| p-value | 0.061 | 0.255 | 0.778 | 0.981 | 0.215 | 0.921 | 0.258 | 0.452 |
| Nontreated observations | 4461 | 3407 | 2163 | 1393 | 2739 | 2000 | 1149 | 735 |
| Treated observations | 12310 | 6292 | 3057 | 1769 | 5032 | 2768 | 1434 | 879 |
| **Percentage of schools with more community participation** | | | | | | | | |
| Nontreated mean | 0.469 | 0.469 | 0.466 | 0.469 | 0.521 | 0.525 | 0.526 | 0.518 |
| Treated mean | 0.469 | 0.479 | 0.479 | 0.469 | 0.526 | 0.536 | 0.535 | 0.523 |
| p-value | 0.952 | 0.302 | 0.340 | 0.977 | 0.686 | 0.463 | 0.657 | 0.852 |
| Nontreated observations | 4941 | 3668 | 2322 | 1511 | 2576 | 1889 | 1084 | 695 |
| Treated observations | 13136 | 6742 | 3311 | 1935 | 4887 | 2666 | 1363 | 834 |

Notes: This table reports descriptive statistics on several school characteristics considering all sample but also subsamples around the zero value of the forcing variable for both primary cycles.

**Table 2.6: Effect of achieving target on autonomous budget (First-stage results)**

| Dependent variable | (PDDE 2008-2009)/$10^4$ | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Panel A: 1st cycle schools | | | | | |
| **1{z>0}** | | | | | |
| Coef. | 0.409 | 0.409 | 0.407 | 0.403 | 0.400 |
| sd | (0.007)*** | (0.009)*** | (0.011)*** | (0.012)*** | (0.016)*** |
| obs | 18356 | 18356 | 18356 | 10628 | 5757 |
| R-squared | 0.862 | 0.862 | 0.862 | 0.857 | 0.850 |
| F-test | 3167.384 | 2076.896 | 1465.079 | 1193.335 | 591.960 |
| Panel B: 2nd cycle schools | | | | | |
| **1{z>0}** | | | | | |
| Coef. | 0.336 | 0.354 | 0.368 | 0.363 | 0.371 |
| sd | (0.014)*** | (0.018)*** | (0.023)*** | (0.022)*** | (0.032)*** |
| obs | 7514 | 7514 | 7514 | 4579 | 2470 |
| R-squared | 0.819 | 0.819 | 0.819 | 0.807 | 0.801 |
| F-test | 551.386 | 366.942 | 265.367 | 261.231 | 138.241 |
| Polynomial form: | | | | | |
| Linear | X | | | X | X |
| Quadratic | | X | | | |
| Cubic | | | X | | |
| Sample: | all | all | all | (0.50 width around the cutoff point) | (0.25 width around the cutoff point) |

Notes: This table reports OLS estimates of the effect of achieving quality target in 2007 on total autonomous budget for 2008-09 period. The variable 1{z>0} indicates that the school accomplished the target. Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index.

**Table 2.7: Effect on student performance, 2009**

| | 1st cycle schools | | | | | | 2nd cycle schools | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Math score (2009)** | -0.084 | -0.005 | 0.033 | 0.031 | 0.021 | 0.033 | -0.038 | 0.022 | 0.046 | 0.023 | 0.010 | 0.009 |
| | (0.007)*** | (0.019) | (0.024) | (0.029) | (0.032) | (0.029) | (0.008)*** | (0.031) | (0.038) | (0.045) | (0.041) | (0.041) |
| | 18,350 | 18,350 | 18,350 | 18,350 | 8,376 | 10,625 | 7,511 | 7,511 | 7,511 | 7,511 | 4,570 | 4,577 |
| **Portuguese score (2009)** | -0.073 | -0.016 | 0.033 | 0.027 | 0.017 | 0.023 | -0.020 | 0.025 | 0.019 | -0.025 | -0.031 | -0.020 |
| | (0.006)*** | (0.017) | (0.021) | (0.025) | (0.030) | (0.026) | (0.008)*** | (0.031) | (0.038) | (0.045) | (0.040) | (0.041) |
| | 18,350 | 18,350 | 18,350 | 18,350 | 7,695 | 10,625 | 7,511 | 7,511 | 7,511 | 7,511 | 4,933 | 4,577 |
| **Pass rate (2009)** | -1.362 | -0.152 | -0.329 | -0.226 | -0.409 | -0.394 | -0.486 | -0.742 | -0.405 | -1.408 | -0.747 | -0.744 |
| | (0.130)*** | (0.363) | (0.448) | (0.535) | (0.475) | (0.550) | (0.257)* | (1.006) | (1.226) | (1.454) | (1.392) | (1.333) |
| | 18,356 | 18,356 | 18,356 | 18,356 | 13,525 | 10,628 | 7,514 | 7,514 | 7,514 | 7,514 | 4,177 | 4,579 |
| **Dropout rate (2009)** | 0.185 | 0.064 | -0.071 | 0.035 | 0.032 | 0.020 | -0.457 | -0.364 | 0.048 | 1.009 | 0.144 | 0.196 |
| | (0.051)*** | (0.143) | (0.178) | (0.211) | (0.205) | (0.219) | (0.116)*** | (0.462) | (0.565) | (0.670) | (0.635) | (0.626) |
| | 18,356 | 18,356 | 18,356 | 18,356 | 12,123 | 10,628 | 7,514 | 7,514 | 7,514 | 7,514 | 4,354 | 4,579 |

Notes: This table reports the effects of extra resources to school committee on academic achievement variables. Columns (1) and (7) present OLS while the others present results considering RDD. Linear specifications are on comlumns (2) and (8), quadratic specifications are on columns (3) and (9), and cubic specifications results are in columns (4) and (10). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (5) and (11)) and also a 0.5 bandwidth (columns (6) and (12)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.8: Effect on community participation at school, 2009**

| | 1st cycle schools | | | | | | 2nd cycle schools | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Active PTA** | 0.049 | -0.008 | -0.057 | 0.007 | -0.042 | -0.036 | 0.031 | -0.121 | -0.090 | -0.095 | 0.018 | -0.162 |
| | (0.023)** | (0.064) | (0.079) | (0.093) | (0.102) | (0.098) | (0.030) | (0.118) | (0.144) | (0.173) | (0.215) | (0.163) |
| | 14473 | 14473 | 14473 | 14473 | 7886 | 8359 | 5868 | 5868 | 5868 | 5868 | 2397 | 3543 |
| **More than 3 PT meetings a year** | 0.061 | -0.115 | -0.085 | 0.037 | -0.017 | 0.051 | 0.084 | -0.001 | -0.039 | -0.134 | -0.030 | -0.024 |
| | (0.021)*** | (0.060)* | (0.074) | (0.089) | (0.099) | (0.093) | (0.028)*** | (0.110) | (0.135) | (0.163) | (0.170) | (0.154) |
| | 14444 | 14444 | 14444 | 14444 | 7320 | 8336 | 5891 | 5891 | 5891 | 5891 | 3040 | 3549 |
| **Community support to principal** | 0.083 | 0.008 | 0.011 | 0.009 | 0.001 | -0.019 | 0.082 | 0.094 | 0.167 | -0.100 | 0.029 | 0.012 |
| | (0.024)*** | (0.069) | (0.085) | (0.100) | (0.080) | (0.106) | (0.032)** | (0.124) | (0.152) | (0.183) | (0.254) | (0.176) |
| | 14670 | 14670 | 14670 | 14670 | 13229 | 8482 | 5930 | 5930 | 5930 | 5930 | 2137 | 3576 |
| **Community organizing activities** | 0.020 | 0.085 | 0.027 | -0.025 | 0.027 | 0.055 | 0.081 | -0.174 | -0.114 | -0.045 | 0.020 | -0.077 |
| | (0.024) | (0.067) | (0.082) | (0.098) | (0.093) | (0.103) | (0.031)*** | (0.121) | (0.150) | (0.179) | (0.202) | (0.169) |
| | 14310 | 14310 | 14310 | 14310 | 9932 | 8297 | 5754 | 5754 | 5754 | 5754 | 2689 | 3470 |
| **Community events organized by communities** | 0.014 | 0.169 | 0.192 | 0.109 | 0.103 | 0.146 | 0.055 | -0.045 | -0.032 | -0.024 | -0.050 | -0.033 |
| | (0.024) | (0.067)** | (0.082)** | (0.098) | (0.096) | (0.103) | (0.031)* | (0.119) | (0.149) | (0.180) | (0.156) | (0.168) |
| | 14555 | 14555 | 14555 | 14555 | 9571 | 8399 | 5883 | 5883 | 5883 | 5883 | 4256 | 3540 |
| **Community events organized by others** | 0.087 | 0.191 | 0.187 | 0.201 | 0.169 | 0.208 | 0.130 | 0.064 | 0.110 | 0.184 | 0.319 | 0.328 |
| | (0.024)*** | (0.067)*** | (0.083)** | (0.098)** | (0.080)** | (0.104)** | (0.031)*** | (0.121) | (0.150) | (0.180) | (0.168)* | (0.170)* |
| | 14560 | 14560 | 14560 | 14560 | 12695 | 8397 | 5896 | 5896 | 5896 | 5896 | 3573 | 3547 |
| **Community events organized by school** | 0.000 | 0.055 | -0.006 | -0.098 | -0.054 | -0.108 | -0.007 | -0.124 | -0.086 | -0.115 | -0.100 | -0.074 |
| | (0.024) | (0.068) | (0.084) | (0.100) | (0.103) | (0.107) | (0.032) | (0.122) | (0.150) | (0.180) | (0.167) | (0.171) |
| | 14545 | 14545 | 14545 | 14545 | 9088 | 8405 | 5861 | 5861 | 5861 | 5861 | 3715 | 3531 |
| **community promoting aid campaigns** | 0.036 | 0.063 | 0.034 | -0.052 | -0.031 | -0.038 | 0.073 | 0.147 | 0.050 | 0.018 | 0.122 | 0.096 |
| | (0.024) | (0.069) | (0.084) | (0.100) | (0.109) | (0.107) | (0.032)** | (0.126) | (0.157) | (0.190) | (0.180) | (0.179) |
| | 14509 | 14509 | 14509 | 14509 | 8140 | 8370 | 5842 | 5842 | 5842 | 5842 | 3467 | 3510 |
| **community working at school maintenance** | 0.051 | -0.004 | -0.018 | 0.006 | 0.053 | -0.011 | 0.033 | 0.094 | 0.209 | 0.220 | 0.053 | 0.186 |
| | (0.024)** | (0.069) | (0.084) | (0.100) | (0.116) | (0.107) | (0.032) | (0.125) | (0.154) | (0.188) | (0.149) | (0.176) |
| | 14354 | 14354 | 14354 | 14354 | 7260 | 8292 | 5780 | 5780 | 5780 | 5780 | 4597 | 3482 |

Notes: This table reports the effects of extra resources to school committee on community participation outcomes. Columns (1) and (7) present OLS while the others present results considering RDD. Linear specifications are on comlumns (2) and (8), quadratic specifications are on columns (3) and (9), and cubic specifications results are in columns (4) and (10). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (5) and (11)) and also a 0.5 bandwidth (columns (6) and (12)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.9: Effect on budget perceptions, 2009**

| | 1st cycle schools | | | | | | 2nd cycle schools | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Panel A: Principal´s survey: | | | | | | | | | | | | |
| **availability of monetary resources** | 0.161 | 0.107 | 0.114 | 0.147 | 0.126 | 0.136 | 0.127 | 0.086 | -0.029 | -0.141 | 0.003 | -0.010 |
| | (0.024)*** | (0.067) | (0.082) | (0.097) | (0.085) | (0.103) | (0.031)*** | (0.122) | (0.150) | (0.179) | (0.191) | (0.170) |
| | 14458 | 14458 | 14458 | 14458 | 11380 | 8366 | 5836 | 5836 | 5836 | 5836 | 2947 | 3516 |
| **availability of pedagogical resources** | 0.185 | 0.120 | 0.149 | 0.188 | 0.036 | 0.166 | 0.220 | 0.071 | 0.075 | -0.007 | 0.030 | 0.097 |
| | (0.024)*** | (0.067)* | (0.082)* | (0.097)* | (0.113) | (0.103) | (0.031)*** | (0.120) | (0.149) | (0.179) | (0.191) | (0.172) |
| | 14641 | 14641 | 14641 | 14641 | 7157 | 8469 | 5934 | 5934 | 5934 | 5934 | 3121 | 3586 |
| Panel B: Teacher´s survey: | | | | | | | | | | | | |
| **availability of monetary resources** | 0.152 | 0.266 | 0.277 | 0.327 | 0.323 | 0.295 | 0.132 | 0.241 | 0.231 | 0.233 | 0.263 | 0.243 |
| | (0.022)*** | (0.063)*** | (0.078)*** | (0.093)*** | (0.095)*** | (0.097)*** | (0.029)*** | (0.116)** | (0.141) | (0.163) | (0.140)* | (0.158) |
| | 15914 | 15914 | 15914 | 15914 | 9791 | 9264 | 6655 | 6655 | 6655 | 6655 | 5134 | 4051 |
| **availability of pedagogical resources** | 0.104 | 0.152 | 0.106 | 0.107 | 0.165 | 0.128 | 0.084 | 0.063 | 0.022 | 0.066 | 0.039 | 0.055 |
| | (0.022)*** | (0.063)** | (0.077) | (0.092) | (0.093)* | (0.096) | (0.029)*** | (0.115) | (0.139) | (0.161) | (0.150) | (0.155) |
| | 15600 | 15600 | 15600 | 15600 | 9845 | 9085 | 6619 | 6619 | 6619 | 6619 | 4359 | 4038 |

Notes: This table reports the effects of extra resources to school committee on budget perceprion variables. Columns (1) and (7) present OLS while the others present results considering RDD. Linear specifications are on comlumns (2) and (8), quadratic specifications are on columns (3) and (9), and cubic specifications results are in columns (4) and (10). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (5) and (11)) and also a 0.5 bandwidth (columns (6) and (12)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

## Table 2.10: Effect on aggregate infrastructure indices, 2009

| | 1st cycle schools | | | | | | 2nd cycle schools | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | OLS | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Panel A: Interviewer´s survey: | | | | | | | | | | | | |
| **Physical Infrastructure Index** | 0.015 | -0.030 | -0.083 | -0.144 | -0.202 | -0.124 | 0.036 | 0.072 | 0.138 | 0.132 | 0.149 | 0.167 |
| | (0.017) | (0.050) | (0.061) | (0.073)** | (0.090)** | (0.075)* | (0.023) | (0.100) | (0.127) | (0.148) | (0.147) | (0.137) |
| | 12,310 | 12,310 | 12,310 | 12,310 | 5,427 | 8,159 | 5,276 | 5,276 | 5,276 | 5,276 | 2,876 | 3,718 |
| **Equipment Infrastructure Index** | 0.120 | 0.111 | 0.108 | 0.099 | 0.113 | 0.098 | 0.102 | 0.006 | 0.087 | -0.005 | 0.055 | 0.072 |
| | (0.013)*** | (0.036)*** | (0.043)** | (0.052)* | (0.042)*** | (0.053)* | (0.017)*** | (0.074) | (0.095) | (0.110) | (0.098) | (0.093) |
| | 11,680 | 11,680 | 11,680 | 11,680 | 10,426 | 8,092 | 4,923 | 4,923 | 4,923 | 4,923 | 3,040 | 3,664 |
| **Literature Index** | 0.066 | -0.026 | -0.055 | -0.044 | -0.043 | -0.050 | 0.051 | 0.019 | 0.049 | 0.058 | 0.004 | -0.041 |
| | (0.017)*** | (0.050) | (0.060) | (0.071) | (0.069) | (0.073) | (0.022)** | (0.092) | (0.118) | (0.145) | (0.165) | (0.123) |
| | 11,366 | 11,366 | 11,366 | 11,366 | 7,594 | 7,467 | 5,473 | 5,473 | 5,473 | 5,473 | 2,283 | 3,776 |
| **Lack of Damage Index** | -0.024 | -0.027 | -0.093 | -0.090 | -0.063 | -0.076 | -0.010 | -0.003 | -0.059 | 0.008 | -0.038 | 0.024 |
| | (0.017) | (0.047) | (0.057) | (0.068) | (0.063) | (0.072) | (0.023) | (0.095) | (0.119) | (0.144) | (0.180) | (0.137) |
| | 13,448 | 13,448 | 13,448 | 13,448 | 9,710 | 8,470 | 5,686 | 5,686 | 5,686 | 5,686 | 2,253 | 3,862 |
| Panel B: Principal´s survey: | | | | | | | | | | | | |
| **Physical Infrastructure Index** | 0.052 | 0.077 | 0.086 | 0.007 | 0.034 | 0.019 | 0.008 | -0.017 | -0.013 | 0.004 | 0.009 | -0.006 |
| | (0.011)*** | (0.032)** | (0.040)** | (0.047) | (0.046) | (0.057) | (0.015) | (0.058) | (0.070) | (0.083) | (0.065) | (0.092) |
| | 13,574 | 13,574 | 13,574 | 13,574 | 8,952 | 8,733 | 5,367 | 5,367 | 5,367 | 5,367 | 4,533 | 3,712 |
| **Equipment Infrastructure Index** | 0.115 | 0.110 | 0.077 | 0.031 | 0.056 | 0.082 | 0.071 | 0.099 | 0.102 | 0.151 | 0.204 | 0.058 |
| | (0.012)*** | (0.034)*** | (0.041)* | (0.049) | (0.046) | (0.053) | (0.016)*** | (0.066) | (0.081) | (0.104) | (0.104)* | (0.089) |
| | 11,667 | 11,667 | 11,667 | 11,667 | 8,379 | 7,848 | 4,617 | 4,617 | 4,617 | 4,617 | 2,250 | 3,328 |
| Panel C: Teacher´s survey: | | | | | | | | | | | | |
| **Equipment Infrastructure Index** | 0.128 | 0.121 | 0.141 | 0.177 | 0.113 | 0.189 | 0.102 | 0.071 | -0.029 | 0.023 | 0.062 | 0.028 |
| | (0.014)*** | (0.039)*** | (0.048)*** | (0.057)*** | (0.069) | (0.068)*** | (0.018)*** | (0.074) | (0.090) | (0.106) | (0.114) | (0.111) |
| | 16,124 | 16,124 | 16,124 | 16,124 | 7,082 | 9,829 | 6,707 | 6,707 | 6,707 | 6,707 | 3,364 | 4,357 |
| **Literature Index** | 0.059 | 0.016 | 0.054 | 0.104 | 0.036 | 0.101 | 0.018 | 0.049 | 0.032 | 0.073 | 0.044 | 0.021 |
| | (0.013)*** | (0.037) | (0.045) | (0.054)* | (0.070) | (0.058)* | (0.018) | (0.071) | (0.086) | (0.101) | (0.115) | (0.098) |
| | 16,192 | 16,192 | 16,192 | 16,192 | 6,403 | 9,838 | 6,716 | 6,716 | 6,716 | 6,716 | 3,116 | 4,341 |
| Panel D: School Census: | | | | | | | | | | | | |
| **Equipment Infrastructure Index** | 0.072 | 0.019 | 0.037 | 0.004 | -0.026 | 0.011 | 0.047 | -0.012 | -0.060 | 0.013 | -0.035 | 0.029 |
| | (0.009)*** | (0.024) | (0.030) | (0.036) | (0.044) | (0.037) | (0.012)*** | (0.047) | (0.058) | (0.067) | (0.079) | (0.063) |
| | 18,356 | 18,356 | 18,356 | 18,356 | 7,487 | 10,628 | 7,514 | 7,514 | 7,514 | 7,514 | 2,909 | 4,579 |
| **Number of computers** | 0.985 | 0.797 | 0.592 | 0.290 | 0.952 | 0.989 | 1.053 | -1.313 | -2.239 | -3.175 | -1.549 | -1.817 |
| | (0.179)*** | (0.504) | (0.622) | (0.740) | (0.675) | (0.725) | (0.303)*** | (1.197) | (1.486) | (1.759)* | (1.230) | (1.384) |
| | 18356 | 18356 | 18356 | 18356 | 11730 | 10628 | 7514 | 7514 | 7514 | 7514 | 5655 | 4579 |
| **Number of administrative computers** | 0.079 | 0.258 | 0.339 | 0.225 | 0.122 | 0.143 | -0.030 | -0.257 | -0.429 | -0.503 | -0.371 | -0.325 |
| | (0.053) | (0.150)* | (0.184)* | (0.219) | (0.217) | (0.229) | (0.091) | (0.370) | (0.454) | (0.538) | (0.403) | (0.498) |
| | 16446 | 16446 | 16446 | 16446 | 10431 | 9494 | 6611 | 6611 | 6611 | 6611 | 5889 | 4025 |
| **Number of student computers** | 0.647 | 0.730 | 0.618 | 0.487 | 0.834 | 1.097 | 0.624 | -1.424 | -1.951 | -2.590 | -1.357 | -1.414 |
| | (0.164)*** | (0.467) | (0.573) | (0.682) | (0.884) | (0.775) | (0.234)*** | (0.950) | (1.177)* | (1.426)* | (1.292) | (1.304) |
| | 14338 | 14338 | 14338 | 14338 | 7026 | 8292 | 5852 | 5852 | 5852 | 5852 | 3660 | 3585 |

Notes: This table reports the effects of extra resources to school committee on aggregate infrastructure indices. Columns (1) and (7) present OLS while the others present results considering RDD. Linear specifications are on comlumns (2) and (8), quadratic specifications are on columns (3) and (9), and cubic specifications results are in columns (4) and (10). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (5) and (11)) and also a 0.5 bandwidth (columns (6) and (12)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.11: Effect on disaggregate infrastructure indices, 2009**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **Roof** | | | | | | | | | | |
| | -0.101 | -0.202 | -0.233 | -0.178 | -0.177 | 0.184 | 0.243 | 0.251 | 0.258 | 0.299 |
| | (0.067) | (0.083)** | (0.098)** | (0.089)** | (0.103)* | (0.128) | (0.163) | (0.196) | (0.211) | (0.187) |
| | 15,221 | 15,221 | 15,221 | 11,344 | 8,809 | 6,411 | 6,411 | 6,411 | 3,088 | 3,868 |
| **Building entrance** | | | | | | | | | | |
| | 0.020 | -0.046 | -0.103 | -0.090 | -0.095 | 0.126 | 0.168 | 0.258 | 0.288 | 0.261 |
| | (0.067) | (0.082) | (0.098) | (0.103) | (0.103) | (0.131) | (0.167) | (0.198) | (0.231) | (0.185) |
| | 15,077 | 15,077 | 15,077 | 8,657 | 8,751 | 6,378 | 6,378 | 6,378 | 2,570 | 3,839 |
| **Classrooms** | | | | | | | | | | |
| | 0.007 | -0.027 | -0.146 | -0.273 | -0.208 | 0.149 | 0.128 | 0.137 | 0.191 | 0.200 |
| | (0.067) | (0.082) | (0.098) | (0.118)** | (0.102)** | (0.131) | (0.167) | (0.197) | (0.198) | (0.189) |
| | 14,733 | 14,733 | 14,733 | 6,502 | 8,533 | 6,236 | 6,236 | 6,236 | 3,468 | 3,764 |
| **Toilets** | | | | | | | | | | |
| | -0.112 | -0.201 | -0.305 | -0.207 | -0.239 | 0.066 | -0.045 | -0.094 | 0.030 | -0.105 |
| | (0.066)* | (0.082)** | (0.097)*** | (0.081)** | (0.102)** | (0.127) | (0.163) | (0.194) | (0.147) | (0.182) |
| | 14,967 | 14,967 | 14,967 | 12,218 | 8,688 | 6,343 | 6,343 | 6,343 | 5,359 | 3,833 |
| **Plumbing installations** | | | | | | | | | | |
| | -0.048 | -0.125 | -0.204 | -0.274 | -0.199 | -0.016 | 0.018 | 0.028 | 0.002 | 0.044 |
| | (0.067) | (0.083) | (0.099)** | (0.114)** | (0.104)* | (0.128) | (0.164) | (0.194) | (0.208) | (0.185) |
| | 14,960 | 14,960 | 14,960 | 7,440 | 8,681 | 6,333 | 6,333 | 6,333 | 3,085 | 3,823 |
| Equipment Infrastructure: | | | | | | | | | | |
| **television** | | | | | | | | | | |
| | 0.077 | 0.119 | 0.181 | 0.129 | 0.168 | 0.092 | 0.181 | 0.221 | 0.190 | 0.184 |
| | (0.067) | (0.083) | (0.099)* | (0.115) | (0.104) | (0.130) | (0.163) | (0.195) | (0.180) | (0.181) |
| | 15,569 | 15,569 | 15,569 | 7,266 | 9,006 | 6,527 | 6,527 | 6,527 | 3,991 | 3,954 |
| **parabolic antenna** | | | | | | | | | | |
| | -0.016 | -0.028 | -0.069 | -0.058 | -0.054 | 0.214 | 0.368 | 0.328 | 0.344 | 0.422 |
| | (0.065) | (0.080) | (0.095) | (0.076) | (0.101) | (0.127)* | (0.159)** | (0.186)* | (0.204)* | (0.178)** |
| | 14,606 | 14,606 | 14,606 | 12,914 | 8,417 | 6,129 | 6,129 | 6,129 | 2,897 | 3,697 |
| **video projector** | | | | | | | | | | |
| | 0.056 | 0.069 | 0.136 | 0.129 | 0.069 | 0.015 | 0.220 | 0.029 | 0.118 | 0.077 |
| | (0.069) | (0.084) | (0.099) | (0.088) | (0.104) | (0.139) | (0.174) | (0.204) | (0.189) | (0.191) |
| | 13,999 | 13,999 | 13,999 | 10,597 | 8,106 | 5,901 | 5,901 | 5,901 | 3,668 | 3,544 |
| **printing machine** | | | | | | | | | | |
| | 0.153 | 0.134 | 0.117 | 0.082 | 0.060 | 0.031 | -0.026 | -0.000 | 0.109 | 0.028 |
| | (0.065)** | (0.080)* | (0.095) | (0.094) | (0.100) | (0.131) | (0.165) | (0.198) | (0.178) | (0.182) |
| | 15,190 | 15,190 | 15,190 | 9,775 | 8,784 | 6,397 | 6,397 | 6,397 | 4,322 | 3,883 |
| **computer** | | | | | | | | | | |
| | 0.130 | 0.191 | 0.196 | 0.228 | 0.241 | 0.089 | 0.172 | 0.237 | 0.257 | 0.314 |
| | (0.066)** | (0.081)** | (0.096)** | (0.108)** | (0.100)** | (0.132) | (0.165) | (0.197) | (0.206) | (0.189)* |
| | 15,289 | 15,289 | 15,289 | 7,877 | 8,840 | 6,453 | 6,453 | 6,453 | 3,251 | 3,903 |

Notes: This table reports the effects of extra resources to school committee on detailed infrastructure indices. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.11: Effect on disaggregate infrastructure indices, 2009 (continued)**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel B: Principal´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **sport court** | | | | | | | | | | |
| | 0.078 | 0.065 | -0.005 | 0.075 | 0.074 | 0.028 | 0.096 | 0.049 | 0.126 | 0.035 |
| | (0.049) | (0.060) | (0.071) | (0.083) | (0.076) | (0.093) | (0.115) | (0.139) | (0.158) | (0.130) |
| | 14,476 | 14,476 | 14,476 | 6,897 | 8,369 | 5,833 | 5,833 | 5,833 | 2,616 | 3,521 |
| **laboratory** | | | | | | | | | | |
| | 0.184 | 0.181 | 0.118 | 0.153 | 0.180 | -0.056 | 0.005 | 0.063 | 0.036 | 0.009 |
| | (0.063)*** | (0.078)** | (0.092) | (0.103) | (0.098)* | (0.115) | (0.141) | (0.168) | (0.152) | (0.157) |
| | 14,481 | 14,481 | 14,481 | 7,704 | 8,375 | 5,822 | 5,822 | 5,822 | 3,799 | 3,512 |
| Equipment Infrastructure: | | | | | | | | | | |
| **computer for students** | | | | | | | | | | |
| | 0.096 | 0.036 | -0.040 | 0.004 | 0.025 | 0.075 | 0.034 | -0.146 | -0.011 | -0.043 |
| | (0.061) | (0.075) | (0.089) | (0.081) | (0.093) | (0.120) | (0.147) | (0.177) | (0.202) | (0.167) |
| | 14,579 | 14,579 | 14,579 | 10,762 | 8,411 | 5,893 | 5,893 | 5,893 | 2,643 | 3,546 |
| **internet for students** | | | | | | | | | | |
| | 0.131 | 0.118 | 0.078 | 0.068 | 0.158 | 0.098 | 0.081 | -0.024 | 0.208 | 0.038 |
| | (0.061)** | (0.074) | (0.088) | (0.076) | (0.093)* | (0.115) | (0.141) | (0.171) | (0.214) | (0.159) |
| | 14,559 | 14,559 | 14,559 | 11,613 | 8,394 | 5,900 | 5,900 | 5,900 | 2,381 | 3,551 |
| **computer for teachers** | | | | | | | | | | |
| | 0.178 | 0.206 | 0.215 | 0.232 | 0.275 | 0.117 | 0.221 | 0.082 | 0.154 | 0.172 |
| | (0.065)*** | (0.080)*** | (0.095)** | (0.085)*** | (0.101)*** | (0.120) | (0.148) | (0.178) | (0.168) | (0.169) |
| | 14,568 | 14,568 | 14,568 | 11,084 | 8,420 | 5,870 | 5,870 | 5,870 | 3,640 | 3,544 |
| **internet for teachers** | | | | | | | | | | |
| | 0.228 | 0.202 | 0.262 | 0.316 | 0.394 | -0.032 | 0.061 | 0.031 | 0.110 | 0.089 |
| | (0.064)*** | (0.079)** | (0.094)*** | (0.087)*** | (0.098)*** | (0.117) | (0.143) | (0.172) | (0.160) | (0.161) |
| | 14,540 | 14,540 | 14,540 | 10,495 | 8,394 | 5,843 | 5,843 | 5,843 | 3,576 | 3,517 |
| **computer for adm staff** | | | | | | | | | | |
| | 0.166 | 0.170 | 0.203 | 0.142 | 0.218 | 0.205 | 0.168 | 0.286 | 0.347 | 0.362 |
| | (0.066)** | (0.080)** | (0.095)** | (0.113) | (0.100)** | (0.120)* | (0.147) | (0.177) | (0.184)* | (0.166)** |
| | 14,551 | 14,551 | 14,551 | 6,595 | 8,386 | 5,871 | 5,871 | 5,871 | 3,064 | 3,540 |
| Panel C: Teacher view | | | | | | | | | | |
| Equipment Infrastructure: | | | | | | | | | | |
| **computer for teachers** | | | | | | | | | | |
| | 0.092 | 0.146 | 0.195 | 0.063 | 0.171 | 0.076 | -0.057 | 0.021 | 0.106 | 0.011 |
| | (0.060) | (0.073)** | (0.087)** | (0.112) | (0.097)* | (0.112) | (0.136) | (0.159) | (0.175) | (0.152) |
| | 16449 | 16449 | 16449 | 6500 | 9629 | 6748 | 6748 | 6748 | 3196 | 4108 |
| **internet for teachers** | | | | | | | | | | |
| | 0.187 | 0.202 | 0.204 | 0.212 | 0.294 | 0.144 | 0.038 | 0.146 | 0.121 | 0.130 |
| | (0.059)*** | (0.072)*** | (0.086)** | (0.097)** | (0.096)*** | (0.108) | (0.132) | (0.154) | (0.149) | (0.148) |
| | 16342 | 16342 | 16342 | 8448 | 9555 | 6730 | 6730 | 6730 | 3961 | 4099 |
| **slide projector** | | | | | | | | | | |
| | 0.037 | 0.028 | 0.083 | 0.122 | 0.054 | 0.039 | -0.101 | -0.123 | 0.003 | 0.026 |
| | (0.052) | (0.064) | (0.076) | (0.081) | (0.091) | (0.104) | (0.127) | (0.149) | (0.143) | (0.143) |
| | 16353 | 16353 | 16353 | 9145 | 9552 | 6737 | 6737 | 6737 | 4039 | 4106 |
| **copy machine** | | | | | | | | | | |
| | 0.199 | 0.197 | 0.212 | 0.086 | 0.303 | 0.001 | -0.005 | 0.038 | 0.004 | 0.072 |
| | (0.057)*** | (0.070)*** | (0.083)** | (0.109) | (0.093)*** | (0.105) | (0.128) | (0.149) | (0.202) | (0.142) |
| | 16527 | 16527 | 16527 | 6330 | 9651 | 6751 | 6751 | 6751 | 2242 | 4110 |

Notes: This table reports the effects of extra resources to school committee on detailed infrastructure indices. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.12: Effect on aggregate infrastructure indices, 2007**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| **Physical Infrastructure Index** | -0.004 | -0.044 | -0.089 | -0.183 | -0.107 | 0.104 | 0.115 | 0.083 | 0.126 | 0.121 |
| | (0.052) | (0.064) | (0.077) | (0.093)** | (0.082) | (0.094) | (0.122) | (0.147) | (0.136) | (0.138) |
| | 12,078 | 12,078 | 12,078 | 5,548 | 6,990 | 5,478 | 5,478 | 5,478 | 3,241 | 3,340 |
| **Equipment Infrastructure Index** | -0.043 | -0.017 | 0.005 | -0.014 | 0.015 | -0.049 | -0.063 | -0.098 | -0.226 | -0.205 |
| | (0.037) | (0.045) | (0.053) | (0.045) | (0.056) | (0.072) | (0.098) | (0.114) | (0.105)** | (0.105)* |
| | 11,536 | 11,536 | 11,536 | 9,336 | 6,640 | 5,110 | 5,110 | 5,110 | 3,056 | 3,097 |
| **Literature Index** | -0.005 | -0.005 | 0.038 | 0.028 | 0.028 | 0.018 | 0.006 | -0.179 | -0.203 | -0.061 |
| | (0.049) | (0.060) | (0.071) | (0.070) | (0.075) | (0.086) | (0.113) | (0.141) | (0.165) | (0.131) |
| | 11,103 | 11,103 | 11,103 | 7,294 | 6,432 | 5,670 | 5,670 | 5,670 | 2,212 | 3,453 |
| **Lack of Damage Index** | 0.048 | 0.050 | 0.032 | 0.031 | 0.056 | 0.078 | 0.098 | -0.016 | -0.110 | 0.000 |
| | (0.050) | (0.062) | (0.073) | (0.066) | (0.078) | (0.094) | (0.121) | (0.145) | (0.180) | (0.144) |
| | 13,249 | 13,249 | 13,249 | 9,734 | 7,642 | 5,904 | 5,904 | 5,904 | 2,382 | 3,590 |
| Panel B: Principal´s survey: | | | | | | | | | | |
| **Physical Infrastructure Index** | 0.021 | -0.060 | -0.077 | -0.042 | -0.037 | 0.051 | 0.073 | 0.058 | 0.061 | 0.068 |
| | (0.037) | (0.046) | (0.055) | (0.057) | (0.058) | (0.068) | (0.087) | (0.107) | (0.080) | (0.099) |
| | 13,347 | 13,347 | 13,347 | 8,297 | 7,708 | 5,598 | 5,598 | 5,598 | 4,826 | 3,392 |
| **Equipment Infrastructure Index** | -0.007 | -0.016 | -0.013 | -0.008 | -0.013 | -0.072 | -0.034 | -0.035 | -0.125 | -0.021 |
| | (0.034) | (0.042) | (0.051) | (0.049) | (0.053) | (0.066) | (0.087) | (0.114) | (0.134) | (0.100) |
| | 11,430 | 11,430 | 11,430 | 7,752 | 6,560 | 4,803 | 4,803 | 4,803 | 1,908 | 2,913 |
| Panel C: Teacher´s survey: | | | | | | | | | | |
| **Equipment Infrastructure Index** | 0.069 | 0.068 | 0.024 | 0.050 | 0.025 | -0.071 | -0.035 | -0.002 | -0.013 | -0.044 |
| | (0.041)* | (0.050) | (0.060) | (0.068) | (0.062) | (0.077) | (0.098) | (0.114) | (0.124) | (0.108) |
| | 16,119 | 16,119 | 16,119 | 7,996 | 9,325 | 7,006 | 7,006 | 7,006 | 3,362 | 4,294 |
| **Literature Index** | 0.021 | -0.026 | -0.072 | 0.062 | 0.040 | -0.089 | -0.042 | -0.129 | -0.160 | -0.136 |
| | (0.038) | (0.047) | (0.056) | (0.074) | (0.061) | (0.073) | (0.092) | (0.107) | (0.118) | (0.104) |
| | 16,190 | 16,190 | 16,190 | 6,265 | 9,366 | 7,011 | 7,011 | 7,011 | 3,474 | 4,284 |
| Panel D: School Census: | | | | | | | | | | |
| **Equipment Infrastructure Index** | -0.005 | -0.027 | -0.034 | -0.053 | -0.003 | 0.007 | 0.009 | -0.102 | 0.010 | -0.034 |
| | (0.030) | (0.037) | (0.044) | (0.057) | (0.046) | (0.054) | (0.068) | (0.080) | (0.099) | (0.076) |
| | 18,266 | 18,266 | 18,266 | 6,870 | 10,565 | 7,856 | 7,856 | 7,856 | 2,854 | 4,819 |
| **Number of computers** | 0.295 | 0.003 | 0.001 | 0.322 | 0.241 | -1.362 | -0.683 | -0.739 | -0.573 | -1.048 |
| | (0.327) | (0.403) | (0.481) | (0.515) | (0.520) | (0.843) | (1.068) | (1.257) | (0.998) | (1.096) |
| | 18263 | 18263 | 18263 | 10802 | 10564 | 7855 | 7855 | 7855 | 5827 | 4818 |
| **Number of administrative computers** | 0.104 | 0.114 | -0.006 | 0.019 | -0.002 | -0.830 | -0.476 | -0.629 | -0.647 | -0.710 |
| | (0.132) | (0.161) | (0.191) | (0.203) | (0.215) | (0.348)** | (0.446) | (0.522) | (0.401) | (0.526) |
| | 16484 | 16484 | 16484 | 10450 | 9510 | 6911 | 6911 | 6911 | 6167 | 4230 |
| **Number of student computers** | 1.246 | 0.907 | 0.657 | 1.295 | 1.078 | -2.724 | -1.371 | -1.602 | -1.509 | -1.751 |
| | (0.439)*** | (0.537)* | (0.637) | (0.738)* | (0.676) | (1.000)*** | (1.270) | (1.469) | (1.405) | (1.396) |
| | 15092 | 15092 | 15092 | 7394 | 8721 | 6315 | 6315 | 6315 | 3963 | 3880 |

Notes: This table reports the effects of extra resources to school committee on pre-treatment aggregate infrastructure indices (2007). The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.13: Effect on student and teacher characteristics, 2009**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **Percentage of female students** | -0.001 | -0.001 | 0.001 | -0.001 | 0.000 | -0.001 | -0.001 | -0.005 | -0.004 | -0.005 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.003) | (0.004) | (0.003) | (0.003) |
| | 20,026 | 20,026 | 20,026 | 14,431 | 11,565 | 8,278 | 8,278 | 8,278 | 5,689 | 5,094 |
| **Socioeconomic Index** | -0.001 | 0.006 | 0.006 | 0.009 | 0.024 | 0.005 | -0.026 | -0.021 | -0.021 | -0.014 |
| | (0.021) | (0.026) | (0.031) | (0.026) | (0.033) | (0.031) | (0.038) | (0.045) | (0.050) | (0.041) |
| | 18,205 | 18,205 | 18,205 | 14,692 | 10,564 | 7,781 | 7,781 | 7,781 | 3,505 | 4,784 |
| **Percentage of teachers with undergraduate degree** | 0.006 | 0.004 | 0.006 | 0.006 | -0.001 | -0.017 | -0.022 | -0.008 | -0.017 | -0.021 |
| | (0.009) | (0.012) | (0.014) | (0.011) | (0.015) | (0.012) | (0.015) | (0.018) | (0.019) | (0.017) |
| | 20,024 | 20,024 | 20,024 | 18,384 | 11,565 | 8,277 | 8,277 | 8,277 | 4,452 | 5,093 |
| **Percentage of teachers with graduate degree** | -0.011 | -0.020 | -0.022 | -0.016 | -0.029 | -0.004 | -0.021 | 0.007 | -0.014 | -0.018 |
| | (0.009) | (0.012)* | (0.014) | (0.014) | (0.015)* | (0.015) | (0.019) | (0.023) | (0.022) | (0.022) |
| | 20,024 | 20,024 | 20,024 | 13,348 | 11,565 | 8,277 | 8,277 | 8,277 | 4,866 | 5,093 |
| **Percentage of female teachers** | -0.001 | -0.001 | 0.004 | -0.001 | -0.000 | -0.019 | -0.021 | -0.013 | -0.017 | -0.009 |
| | (0.004) | (0.005) | (0.006) | (0.007) | (0.007) | (0.008)** | (0.010)** | (0.012) | (0.010)* | (0.012) |
| | 20,024 | 20,024 | 20,024 | 12,497 | 11,565 | 8,277 | 8,277 | 8,277 | 6,736 | 5,093 |
| **Student-teacher ratio** | -0.248 | -0.115 | -0.169 | -0.187 | -0.076 | -0.066 | -0.839 | -1.128 | -2.045 | -1.419 |
| | (0.353) | (0.441) | (0.524) | (0.605) | (0.550) | (0.543) | (0.681) | (0.813) | (0.845)** | (0.712)** |
| | 20,024 | 20,024 | 20,024 | 9,597 | 11,565 | 8,277 | 8,277 | 8,277 | 3,716 | 5,093 |

Notes: This table reports the effects of extra resources to school committee on 2009 teacher and student characteristics. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.14: Effect on aggregate infrastructure indices by mother´s education, 1st cycle schools**

| | Less educated mothers | | | | | More educated mothers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | -0.052 | -0.104 | -0.216 | -0.422 | -0.243 | 0.013 | -0.075 | -0.095 | 0.001 | -0.042 |
| | (0.083) | (0.101) | (0.124)* | (0.158)*** | (0.134)* | (0.068) | (0.086) | (0.107) | (0.116) | (0.100) |
| | 5190 | 5190 | 5190 | 2238 | 2955 | 5473 | 5473 | 5473 | 2491 | 3241 |
| **Equipment Infrastructure** | 0.150 | 0.125 | 0.085 | 0.137 | 0.065 | 0.109 | 0.123 | 0.159 | 0.127 | 0.169 |
| | (0.059)** | (0.070)* | (0.085) | (0.069)** | (0.089) | (0.049)** | (0.061)** | (0.077)** | (0.056)** | (0.073)** |
| | 4932 | 4932 | 4932 | 4367 | 2767 | 5202 | 5202 | 5202 | 4686 | 3095 |
| **Literature** | -0.096 | -0.175 | -0.224 | -0.176 | -0.174 | 0.032 | 0.051 | 0.122 | 0.098 | 0.046 |
| | (0.083) | (0.099)* | (0.119)* | (0.115) | (0.128) | (0.067) | (0.082) | (0.101) | (0.091) | (0.097) |
| | 4647 | 4647 | 4647 | 3019 | 2619 | 5262 | 5262 | 5262 | 3609 | 3139 |
| **Lack of Damage Index** | -0.143 | -0.255 | -0.323 | -0.301 | -0.444 | 0.031 | 0.037 | 0.109 | 0.089 | 0.082 |
| | (0.081)* | (0.097)*** | (0.118)*** | (0.110)*** | (0.130)*** | (0.065) | (0.081) | (0.100) | (0.084) | (0.094) |
| | 5630 | 5630 | 5630 | 3974 | 3175 | 5987 | 5987 | 5987 | 4412 | 3548 |
| Panel B: Principal´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | 0.053 | 0.089 | 0.015 | 0.096 | 0.119 | 0.122 | 0.129 | -0.015 | 0.037 | 0.051 |
| | (0.051) | (0.061) | (0.072) | (0.073) | (0.080) | (0.047)*** | (0.060)** | (0.073) | (0.067) | (0.070) |
| | 5682 | 5682 | 5682 | 3677 | 3235 | 5882 | 5882 | 5882 | 3967 | 3471 |
| **Equipment Infrastructure** | 0.122 | 0.039 | -0.041 | 0.024 | 0.072 | 0.116 | 0.152 | 0.041 | 0.111 | 0.135 |
| | (0.057)** | (0.068) | (0.083) | (0.079) | (0.091) | (0.046)** | (0.059)*** | (0.071) | (0.062)* | (0.069)* |
| | 4847 | 4847 | 4847 | 3442 | 2759 | 5047 | 5047 | 5047 | 3665 | 2940 |
| Panel C: Teacher´s survey: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.144 | 0.094 | 0.121 | 0.111 | 0.210 | 0.101 | 0.222 | 0.212 | 0.165 | 0.266 |
| | (0.066)** | (0.079) | (0.097) | (0.119) | (0.104)** | (0.051)** | (0.064)*** | (0.078)*** | (0.089)* | (0.077)*** |
| | 6831 | 6831 | 6831 | 2906 | 3849 | 7362 | 7362 | 7362 | 3327 | 4378 |
| **Literature** | 0.047 | 0.039 | 0.135 | 0.057 | 0.081 | -0.016 | 0.104 | 0.047 | 0.059 | 0.137 |
| | (0.063) | (0.076) | (0.093) | (0.122) | (0.100) | (0.049) | (0.061)* | (0.074) | (0.090) | (0.073)* |
| | 6838 | 6838 | 6838 | 2625 | 3853 | 7402 | 7402 | 7402 | 2993 | 4398 |
| Panel D: School Census: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.065 | 0.074 | 0.050 | 0.031 | 0.056 | 0.011 | 0.077 | -0.013 | -0.014 | 0.033 |
| | (0.042) | (0.051) | (0.062) | (0.073) | (0.066) | (0.031) | (0.039)** | (0.048) | (0.054) | (0.047) |
| | 7768 | 7768 | 7768 | 3449 | 4394 | 8187 | 8187 | 8187 | 3866 | 4860 |
| **Number of computers** | 0.351 | 0.039 | -0.841 | 0.656 | 0.522 | 1.445 | 1.130 | 0.989 | 1.323 | 1.355 |
| | (0.889) | (1.070) | (1.307) | (1.000) | (1.020) | (0.689)** | (0.859) | (1.051) | (1.109) | (1.133) |
| | 7768 | 7768 | 7768 | 4490 | 4394 | 8187 | 8187 | 8187 | 4969 | 4860 |
| **Number of administrative computers** | 0.330 | 0.447 | 0.422 | 0.314 | 0.413 | 0.049 | -0.025 | -0.403 | -0.253 | -0.333 |
| | (0.223) | (0.267)* | (0.324) | (0.335) | (0.323) | (0.202) | (0.252) | (0.310) | (0.320) | (0.300) |
| | 6987 | 6987 | 6987 | 3532 | 3950 | 7422 | 7422 | 7422 | 3950 | 4368 |
| **Number of student computers** | -0.131 | -0.329 | -0.782 | -0.138 | -0.077 | 1.810 | 1.723 | 2.043 | 2.629 | 2.449 |
| | (0.671) | (0.806) | (0.990) | (1.052) | (1.014) | (0.750)** | (0.933)* | (1.146)* | (1.352)* | (1.277)* |
| | 6139 | 6139 | 6139 | 3306 | 3478 | 6440 | 6440 | 6440 | 3627 | 3800 |

Notes: This table reports the effects of extra resources to school committee on 2009 aggregate infrastructure indices for 1st cycle schools according to mother education. A school with more educated mothers have more than 50% of the mothers with al least complete primary cycle. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.15: Effect on aggregate infrastructure indices by mother´s education, 2nd cycle schools**

| | Less educated mothers | | | | | More educated mothers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | 0.069 | 0.054 | 0.255 | 0.060 | 0.008 | 0.073 | 0.278 | 0.217 | 0.307 | 0.418 |
| | (0.128) | (0.170) | (0.207) | (0.179) | (0.173) | (0.157) | (0.206) | (0.223) | (0.237) | (0.236)* |
| | 2578 | 2578 | 2578 | 1437 | 1592 | 2520 | 2520 | 2520 | 1357 | 1510 |
| **Equipment Infrastructure** | 0.054 | 0.079 | 0.074 | 0.080 | 0.054 | -0.071 | 0.114 | -0.028 | 0.034 | 0.042 |
| | (0.101) | (0.129) | (0.162) | (0.125) | (0.129) | (0.111) | (0.146) | (0.159) | (0.160) | (0.158) |
| | 2374 | 2374 | 2374 | 1505 | 1472 | 2381 | 2381 | 2381 | 1448 | 1410 |
| **Literature** | 0.138 | 0.106 | 0.192 | 0.057 | 0.040 | -0.134 | 0.013 | 0.026 | -0.015 | 0.043 |
| | (0.120) | (0.157) | (0.209) | (0.224) | (0.174) | (0.143) | (0.188) | (0.211) | (0.235) | (0.214) |
| | 2570 | 2570 | 2570 | 1101 | 1592 | 2705 | 2705 | 2705 | 1109 | 1619 |
| **Lack of Damage Index** | 0.065 | -0.084 | -0.065 | -0.202 | -0.096 | -0.087 | -0.082 | 0.023 | 0.046 | 0.024 |
| | (0.126) | (0.162) | (0.219) | (0.240) | (0.181) | (0.148) | (0.190) | (0.209) | (0.258) | (0.225) |
| | 2764 | 2764 | 2764 | 1126 | 1709 | 2725 | 2725 | 2725 | 1059 | 1623 |
| Panel B: Principal´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | -0.050 | -0.037 | 0.014 | -0.008 | -0.054 | 0.027 | 0.022 | 0.019 | 0.031 | 0.058 |
| | (0.072) | (0.089) | (0.117) | (0.082) | (0.098) | (0.094) | (0.115) | (0.125) | (0.103) | (0.127) |
| | 2671 | 2671 | 2671 | 2295 | 1650 | 2487 | 2487 | 2487 | 2083 | 1472 |
| **Equipment Infrastructure** | 0.068 | 0.137 | 0.191 | 0.151 | 0.143 | 0.105 | 0.077 | 0.157 | 0.286 | 0.190 |
| | (0.087) | (0.110) | (0.152) | (0.145) | (0.121) | (0.103) | (0.126) | (0.145) | (0.148)* | (0.146) |
| | 2317 | 2317 | 2317 | 1174 | 1433 | 2114 | 2114 | 2114 | 997 | 1251 |
| Panel C: Teacher´s survey: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.018 | 0.034 | 0.083 | 0.015 | 0.107 | 0.138 | -0.034 | -0.015 | 0.111 | 0.057 |
| | (0.101) | (0.128) | (0.165) | (0.163) | (0.137) | (0.107) | (0.133) | (0.144) | (0.158) | (0.150) |
| | 3275 | 3275 | 3275 | 1685 | 2038 | 3254 | 3254 | 3254 | 1605 | 1962 |
| **Literature** | -0.019 | -0.008 | 0.082 | 0.006 | 0.009 | 0.151 | 0.121 | 0.097 | 0.071 | 0.171 |
| | (0.097) | (0.123) | (0.158) | (0.167) | (0.133) | (0.105) | (0.129) | (0.140) | (0.160) | (0.156) |
| | 3276 | 3276 | 3276 | 1556 | 2032 | 3261 | 3261 | 3261 | 1486 | 1962 |
| Panel D: School Census: | | | | | | | | | | |
| **Equipment Infrastructure** | -0.100 | -0.091 | -0.078 | -0.058 | -0.056 | 0.097 | 0.037 | 0.097 | 0.128 | 0.128 |
| | (0.067) | (0.085) | (0.111) | (0.090) | (0.089) | (0.066) | (0.081) | (0.087) | (0.092) | (0.092) |
| | 3691 | 3691 | 3691 | 2289 | 2292 | 3581 | 3581 | 3581 | 2164 | 2165 |
| **Number of computers** | -2.897 | -3.812 | -4.952 | -2.943 | -2.973 | 0.020 | 0.287 | -0.798 | 0.223 | -0.404 |
| | (1.740)* | (2.242)* | (2.964)* | (1.439)** | (1.538)* | (1.604) | (1.987) | (2.174) | (2.160) | (2.465) |
| | 3691 | 3691 | 3691 | 2770 | 2292 | 3581 | 3581 | 3581 | 2631 | 2165 |
| **Number of administrative computers** | -0.594 | -0.190 | -0.487 | -0.414 | -0.084 | -0.305 | 0.064 | -0.390 | 0.009 | -0.682 |
| | (0.449) | (0.567) | (0.741) | (0.489) | (0.573) | (0.541) | (0.665) | (0.729) | (0.583) | (0.763) |
| | 3241 | 3241 | 3241 | 3024 | 2007 | 3168 | 3168 | 3168 | 2927 | 1915 |
| **Number of student computers** | -2.386 | -2.525 | -3.206 | -2.096 | -2.460 | -0.518 | -0.734 | -1.114 | -0.249 | 0.342 |
| | (1.155)** | (1.478)* | (1.914)* | (1.495) | (1.439)* | (1.577) | (1.962) | (2.152) | (2.608) | (2.382) |
| | 2876 | 2876 | 2876 | 1634 | 1790 | 2799 | 2799 | 2799 | 1553 | 1705 |

Notes: This table reports the effects of extra resources to school committee on 2009 aggregate infrastructure indices for 2nd cycle schools according to mother education. A school with more educated mothers have more than 50% of the mothers with al least complete primary cycle. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.16: Effect on detailed infrastructure indices by mother´s education, 1st cycle schools**

| | Less educated mothers | | | | | More educated mothers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **Roof** | | | | | | | | | | |
| | -0.117 | -0.238 | -0.322 | -0.276 | -0.277 | -0.146 | -0.216 | -0.175 | -0.208 | -0.158 |
| | (0.109) | (0.131)* | (0.159)** | (0.144)* | (0.169) | (0.096) | (0.121)* | (0.149) | (0.124)* | (0.141) |
| | 6442 | 6442 | 6442 | 4706 | 3642 | 6730 | 6730 | 6730 | 5123 | 3999 |
| **Building entrance** | | | | | | | | | | |
| | 0.041 | -0.055 | -0.164 | -0.101 | -0.107 | 0.013 | -0.035 | -0.121 | -0.048 | -0.056 |
| | (0.114) | (0.137) | (0.168) | (0.180) | (0.180) | (0.090) | (0.115) | (0.143) | (0.133) | (0.132) |
| | 6369 | 6369 | 6369 | 3569 | 3609 | 6693 | 6693 | 6693 | 3945 | 3988 |
| **Classrooms** | | | | | | | | | | |
| | -0.086 | -0.110 | -0.289 | -0.584 | -0.385 | 0.063 | -0.059 | -0.106 | -0.027 | -0.106 |
| | (0.109) | (0.130) | (0.159)* | (0.201)*** | (0.171)** | (0.094) | (0.119) | (0.147) | (0.160) | (0.136) |
| | 6229 | 6229 | 6229 | 2669 | 3523 | 6530 | 6530 | 6530 | 2991 | 3890 |
| **Toilets** | | | | | | | | | | |
| | -0.141 | -0.240 | -0.407 | -0.246 | -0.367 | -0.077 | -0.169 | -0.301 | -0.177 | -0.150 |
| | (0.109) | (0.131)* | (0.160)** | (0.135)* | (0.173)** | (0.092) | (0.117) | (0.143)** | (0.110) | (0.135) |
| | 6322 | 6322 | 6322 | 5076 | 3581 | 6650 | 6650 | 6650 | 5524 | 3975 |
| **Plumbing installations** | | | | | | | | | | |
| | -0.063 | -0.131 | -0.249 | -0.499 | -0.290 | -0.033 | -0.097 | -0.157 | -0.102 | -0.096 |
| | (0.111) | (0.134) | (0.164) | (0.191)*** | (0.176)* | (0.093) | (0.118) | (0.147) | (0.152) | (0.140) |
| | 6319 | 6319 | 6319 | 3062 | 3575 | 6646 | 6646 | 6646 | 3405 | 3963 |
| Equipment Infrastructure: | | | | | | | | | | |
| **television** | | | | | | | | | | |
| | 0.077 | 0.050 | 0.069 | -0.105 | -0.039 | 0.072 | 0.163 | 0.305 | 0.291 | 0.345 |
| | (0.115) | (0.137) | (0.168) | (0.207) | (0.182) | (0.092) | (0.117) | (0.146)** | (0.150)* | (0.138)** |
| | 6568 | 6568 | 6568 | 2968 | 3703 | 6943 | 6943 | 6943 | 3343 | 4123 |
| **parabolic antenna** | | | | | | | | | | |
| | -0.085 | -0.076 | -0.080 | -0.127 | -0.061 | 0.060 | 0.030 | 0.083 | 0.050 | 0.074 |
| | (0.105) | (0.127) | (0.155) | (0.124) | (0.165) | (0.092) | (0.116) | (0.145) | (0.107) | (0.139) |
| | 6188 | 6188 | 6188 | 5427 | 3484 | 6488 | 6488 | 6488 | 5790 | 3837 |
| **video projector** | | | | | | | | | | |
| | 0.108 | 0.083 | 0.228 | 0.204 | 0.089 | 0.037 | 0.062 | 0.002 | 0.051 | 0.062 |
| | (0.111) | (0.133) | (0.162) | (0.143) | (0.173) | (0.098) | (0.122) | (0.151) | (0.122) | (0.142) |
| | 5892 | 5892 | 5892 | 4365 | 3322 | 6238 | 6238 | 6238 | 4813 | 3698 |
| **printing machine** | | | | | | | | | | |
| | 0.313 | 0.216 | 0.125 | 0.152 | 0.160 | 0.025 | 0.084 | -0.012 | 0.044 | -0.017 |
| | (0.113)*** | (0.135) | (0.165) | (0.168) | (0.179) | (0.083) | (0.106) | (0.132) | (0.118) | (0.123) |
| | 6386 | 6386 | 6386 | 4013 | 3593 | 6790 | 6790 | 6790 | 4476 | 4045 |
| **computer** | | | | | | | | | | |
| | 0.093 | 0.095 | 0.040 | 0.111 | 0.100 | 0.153 | 0.283 | 0.297 | 0.312 | 0.310 |
| | (0.111) | (0.133) | (0.162) | (0.182) | (0.172) | (0.087)* | (0.111)** | (0.138)** | (0.139)** | (0.129)** |
| | 6445 | 6445 | 6445 | 3222 | 3631 | 6829 | 6829 | 6829 | 3636 | 4059 |

Notes: This table reports the effects of extra resources to school committee on 2009 detailed infrastructure indices for 1st cycle schools according to mother education. A school with more educated mothers have more than 50% of the mothers with al least complete primary cycle. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.16: Effect on detailed infrastructure indices by mother´s education, 1st cycle schools (continued)**

| | Less educated mothers | | | | | More educated mothers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel B: Principal´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **sport court** | | | | | | | | | | |
| | 0.108 | 0.107 | -0.001 | 0.063 | 0.218 | 0.112 | 0.128 | 0.027 | 0.152 | 0.041 |
| | (0.081) | (0.095) | (0.113) | (0.133) | (0.124)* | (0.071) | (0.089) | (0.108) | (0.119) | (0.108) |
| | 6047 | 6047 | 6047 | 2814 | 3430 | 6329 | 6329 | 6329 | 3097 | 3743 |
| **laboratory** | | | | | | | | | | |
| | 0.163 | 0.166 | 0.135 | 0.259 | 0.269 | 0.314 | 0.259 | 0.040 | 0.175 | 0.179 |
| | (0.102) | (0.121) | (0.144) | (0.162) | (0.157)* | (0.095)*** | (0.119)** | (0.145) | (0.153) | (0.143) |
| | 6066 | 6066 | 6066 | 3157 | 3445 | 6314 | 6314 | 6314 | 3449 | 3735 |
| Equipment Infrastructure: | | | | | | | | | | |
| **computer for students** | | | | | | | | | | |
| | 0.075 | -0.008 | -0.110 | 0.014 | 0.081 | 0.134 | 0.098 | -0.035 | 0.046 | 0.041 |
| | (0.102) | (0.120) | (0.143) | (0.133) | (0.153) | (0.085) | (0.107) | (0.131) | (0.112) | (0.128) |
| | 6093 | 6093 | 6093 | 4416 | 3452 | 6384 | 6384 | 6384 | 4794 | 3760 |
| **internet for students** | | | | | | | | | | |
| | 0.107 | 0.068 | 0.009 | 0.032 | 0.193 | 0.194 | 0.218 | 0.145 | 0.188 | 0.232 |
| | (0.101) | (0.119) | (0.142) | (0.123) | (0.153) | (0.085)** | (0.107)** | (0.131) | (0.105)* | (0.130)* |
| | 6093 | 6093 | 6093 | 4776 | 3453 | 6358 | 6358 | 6358 | 5164 | 3741 |
| **computer for teachers** | | | | | | | | | | |
| | 0.196 | 0.172 | 0.180 | 0.199 | 0.221 | 0.255 | 0.341 | 0.267 | 0.331 | 0.367 |
| | (0.110)* | (0.129) | (0.154) | (0.140) | (0.168) | (0.090)*** | (0.113)*** | (0.138)* | (0.117)*** | (0.137)*** |
| | 6089 | 6089 | 6089 | 4538 | 3459 | 6368 | 6368 | 6368 | 4940 | 3759 |
| **internet for teachers** | | | | | | | | | | |
| | 0.113 | -0.033 | 0.019 | 0.117 | 0.216 | 0.362 | 0.505 | 0.505 | 0.528 | 0.580 |
| | (0.108) | (0.127) | (0.151) | (0.144) | (0.163) | (0.090)*** | (0.113)*** | (0.139)*** | (0.121)*** | (0.136)*** |
| | 6089 | 6089 | 6089 | 4306 | 3447 | 6353 | 6353 | 6353 | 4678 | 3748 |
| **computer for adm staff** | | | | | | | | | | |
| | 0.238 | 0.126 | 0.134 | 0.083 | 0.115 | 0.124 | 0.258 | 0.135 | 0.114 | 0.253 |
| | (0.114)** | (0.135) | (0.161) | (0.196) | (0.176) | (0.087) | (0.109)** | (0.132) | (0.148) | (0.128)** |
| | 6083 | 6083 | 6083 | 2695 | 3444 | 6358 | 6358 | 6358 | 2959 | 3740 |

Notes: This table reports the effects of extra resources to school committee on 2009 detailed infrastructure indices for 1st cycle schools according to mother education. A school with more educated mothers have more than 50% of the mothers with al least complete primary cycle. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.17: Effect on aggregate infrastructure indices by community engagement, 1st cycle schools**

| | Less community engagement | | | | | More community engagement | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | -0.155 | -0.276 | -0.283 | -0.318 | -0.327 | 0.054 | 0.059 | 0.001 | -0.122 | 0.048 |
| | (0.074)** | (0.097)*** | (0.119)** | (0.133)** | (0.114)*** | (0.072) | (0.088) | (0.107) | (0.132) | (0.115) |
| | 6013 | 6013 | 6013 | 2629 | 3439 | 5586 | 5586 | 5586 | 2471 | 3257 |
| **Equipment Infrastructure** | 0.129 | 0.097 | 0.028 | 0.121 | 0.075 | 0.091 | 0.099 | 0.116 | 0.107 | 0.103 |
| | (0.055)** | (0.071) | (0.090) | (0.064)* | (0.082) | (0.050)* | (0.059)* | (0.071) | (0.058)* | (0.078) |
| | 5680 | 5680 | 5680 | 5056 | 3256 | 5319 | 5319 | 5319 | 4759 | 3080 |
| **Literature** | -0.067 | -0.056 | 0.042 | -0.010 | 0.020 | -0.049 | -0.102 | -0.136 | -0.122 | -0.218 |
| | (0.078) | (0.100) | (0.120) | (0.107) | (0.118) | (0.070) | (0.083) | (0.099) | (0.097) | (0.105)** |
| | 5336 | 5336 | 5336 | 3568 | 3060 | 5366 | 5366 | 5366 | 3578 | 3142 |
| **Lack of Damage Index** | -0.060 | -0.134 | -0.092 | -0.088 | -0.170 | 0.005 | -0.056 | -0.045 | -0.035 | -0.072 |
| | (0.070) | (0.090) | (0.110) | (0.092) | (0.105) | (0.068) | (0.081) | (0.098) | (0.091) | (0.107) |
| | 6583 | 6583 | 6583 | 4773 | 3772 | 6093 | 6093 | 6093 | 4382 | 3540 |
| Panel B: Principal´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | 0.021 | -0.023 | -0.122 | -0.079 | -0.064 | 0.134 | 0.188 | 0.134 | 0.178 | 0.205 |
| | (0.044) | (0.055) | (0.066)* | (0.061) | (0.065) | (0.050)*** | (0.060)*** | (0.072)* | (0.073)** | (0.079)*** |
| | 7086 | 7086 | 7086 | 4672 | 4049 | 6071 | 6071 | 6071 | 4001 | 3559 |
| **Equipment Infrastructure** | 0.124 | 0.106 | 0.008 | 0.099 | 0.160 | 0.089 | 0.049 | -0.004 | 0.018 | 0.039 |
| | (0.048)*** | (0.061)* | (0.073) | (0.066) | (0.073)** | (0.048)* | (0.058) | (0.072) | (0.066) | (0.076) |
| | 6084 | 6084 | 6084 | 4385 | 3479 | 5247 | 5247 | 5247 | 3751 | 3032 |
| Panel C: Teacher´s survey: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.198 | 0.241 | 0.179 | 0.186 | 0.323 | 0.051 | 0.051 | 0.130 | -0.013 | 0.065 |
| | (0.060)*** | (0.076)*** | (0.091)** | (0.104)* | (0.091)*** | (0.055) | (0.066) | (0.081) | (0.101) | (0.088) |
| | 8091 | 8091 | 8091 | 3488 | 4618 | 7046 | 7046 | 7046 | 3148 | 4147 |
| **Literature** | -0.008 | 0.123 | 0.075 | 0.033 | 0.138 | 0.055 | 0.045 | 0.099 | 0.077 | 0.064 |
| | (0.056) | (0.072)* | (0.086) | (0.106) | (0.085) | (0.053) | (0.064) | (0.078) | (0.103) | (0.085) |
| | 8124 | 8124 | 8124 | 3162 | 4632 | 7079 | 7079 | 7079 | 2842 | 4168 |
| Panel D: School Census: | | | | | | | | | | |
| **Equipment Infrastructure** | -0.002 | 0.022 | -0.092 | -0.021 | -0.004 | 0.055 | 0.073 | 0.059 | 0.030 | 0.050 |
| | (0.038) | (0.048) | (0.058) | (0.063) | (0.056) | (0.034) | (0.041)* | (0.050) | (0.061) | (0.055) |
| | 9153 | 9153 | 9153 | 4124 | 5222 | 8050 | 8050 | 8050 | 3723 | 4723 |
| **Number of computers** | 0.621 | -0.551 | -1.189 | -0.317 | -0.515 | 1.006 | 1.512 | 1.727 | 2.399 | 2.632 |
| | (0.597) | (0.767) | (0.922) | (0.893) | (0.907) | (0.895) | (1.082) | (1.315) | (1.227)* | (1.262)** |
| | 9153 | 9153 | 9153 | 5330 | 5222 | 8050 | 8050 | 8050 | 4838 | 4723 |
| **Number of administrative computers** | 0.090 | -0.020 | -0.139 | -0.030 | -0.076 | 0.404 | 0.651 | 0.508 | 0.210 | 0.281 |
| | (0.164) | (0.211) | (0.254) | (0.263) | (0.244) | (0.262) | (0.314)** | (0.379) | (0.428) | (0.411) |
| | 8184 | 8184 | 8184 | 4151 | 4631 | 7227 | 7227 | 7227 | 3846 | 4256 |
| **Number of student computers** | 0.467 | -0.399 | -0.946 | -0.214 | -0.387 | 1.362 | 1.747 | 2.239 | 2.966 | 3.007 |
| | (0.641) | (0.824) | (0.984) | (1.047) | (1.006) | (0.751)* | (0.899)* | (1.092)** | (1.377)** | (1.304)** |
| | 7078 | 7078 | 7078 | 3810 | 4012 | 6349 | 6349 | 6349 | 3569 | 3741 |

Notes: This table reports the effects of extra resources to school committee on 2009 aggregate infrastructure indices for 1st cycle schools according to community engagement. Schools where PTA meetings happen at least 3 times a year and parents organize community activities are defined as schools with a more engaged community. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.18: Effect on aggregate infrastructure indices by community engagement, 2nd cycle schools**

| | Less community engagement | | | | | More community engagement | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | -0.000 | -0.086 | -0.047 | 0.008 | -0.022 | 0.203 | 0.380 | 0.354 | 0.316 | 0.352 |
| | (0.154) | (0.196) | (0.224) | (0.233) | (0.232) | (0.141) | (0.179)** | (0.208)* | (0.196) | (0.187)* |
| | 2347 | 2347 | 2347 | 1273 | 1405 | 2607 | 2607 | 2607 | 1428 | 1594 |
| **Equipment Infrastructure** | -0.028 | 0.006 | -0.112 | -0.039 | -0.061 | 0.106 | 0.232 | 0.183 | 0.181 | 0.170 |
| | (0.110) | (0.143) | (0.166) | (0.156) | (0.158) | (0.106) | (0.130)* | (0.151) | (0.125) | (0.128) |
| | 2128 | 2128 | 2128 | 1298 | 1273 | 2483 | 2483 | 2483 | 1550 | 1509 |
| **Literature** | 0.024 | 0.034 | 0.021 | -0.051 | -0.144 | 0.103 | 0.151 | 0.168 | 0.104 | 0.225 |
| | (0.147) | (0.199) | (0.238) | (0.255) | (0.237) | (0.120) | (0.148) | (0.179) | (0.202) | (0.160) |
| | 2388 | 2388 | 2388 | 969 | 1429 | 2736 | 2736 | 2736 | 1167 | 1675 |
| **Lack of Damage Index** | 0.038 | 0.040 | 0.172 | 0.120 | 0.000 | 0.004 | -0.062 | 0.028 | -0.162 | 0.005 |
| | (0.150) | (0.194) | (0.242) | (0.283) | (0.241) | (0.129) | (0.156) | (0.189) | (0.231) | (0.174) |
| | 2523 | 2523 | 2523 | 976 | 1503 | 2806 | 2806 | 2806 | 1138 | 1714 |
| Panel B: Principal´s survey: | | | | | | | | | | |
| **Physical Infrastructure** | -0.005 | -0.013 | 0.099 | 0.045 | 0.079 | -0.038 | 0.002 | -0.078 | -0.003 | -0.063 |
| | (0.077) | (0.095) | (0.116) | (0.088) | (0.116) | (0.087) | (0.103) | (0.121) | (0.095) | (0.105) |
| | 2515 | 2515 | 2515 | 2108 | 1496 | 2694 | 2694 | 2694 | 2295 | 1640 |
| **Equipment Infrastructure** | 0.162 | 0.166 | 0.226 | 0.264 | 0.187 | 0.026 | 0.073 | 0.075 | 0.162 | 0.122 |
| | (0.093)* | (0.114) | (0.144) | (0.135)* | (0.132) | (0.096) | (0.119) | (0.150) | (0.159) | (0.128) |
| | 2152 | 2152 | 2152 | 1043 | 1286 | 2341 | 2341 | 2341 | 1144 | 1413 |
| Panel C: Teacher´s survey: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.233 | 0.016 | -0.041 | -0.078 | 0.004 | -0.040 | -0.027 | 0.093 | 0.271 | 0.133 |
| | (0.112)** | (0.135) | (0.157) | (0.161) | (0.160) | (0.106) | (0.128) | (0.156) | (0.173) | (0.136) |
| | 3007 | 3007 | 3007 | 1495 | 1803 | 3233 | 3233 | 3233 | 1644 | 2007 |
| **Literature** | 0.066 | -0.014 | 0.053 | 0.076 | 0.085 | 0.033 | 0.053 | 0.114 | -0.044 | 0.053 |
| | (0.109) | (0.132) | (0.152) | (0.167) | (0.165) | (0.099) | (0.120) | (0.145) | (0.161) | (0.128) |
| | 3010 | 3010 | 3010 | 1379 | 1798 | 3240 | 3240 | 3240 | 1528 | 2008 |
| Panel D: School Census: | | | | | | | | | | |
| **Equipment Infrastructure** | 0.004 | -0.098 | -0.018 | 0.035 | 0.036 | -0.012 | 0.026 | 0.056 | 0.040 | 0.041 |
| | (0.071) | (0.087) | (0.100) | (0.100) | (0.100) | (0.067) | (0.081) | (0.098) | (0.086) | (0.086) |
| | 3324 | 3324 | 3324 | 1999 | 2000 | 3655 | 3655 | 3655 | 2254 | 2256 |
| **Number of computers** | 0.260 | 0.948 | 0.738 | 1.927 | 1.795 | -2.711 | -4.631 | -6.894 | -4.869 | -5.019 |
| | (1.212) | (1.483) | (1.736) | (1.478) | (1.657) | (2.206) | (2.741)* | (3.383)** | (2.108)** | (2.325)** |
| | 3324 | 3324 | 3324 | 2414 | 2000 | 3655 | 3655 | 3655 | 2738 | 2256 |
| **Number of administrative computers** | -0.377 | -0.293 | -0.365 | -0.343 | -0.383 | -0.070 | 0.314 | -0.274 | 0.369 | 0.115 |
| | (0.398) | (0.490) | (0.578) | (0.437) | (0.639) | (0.633) | (0.762) | (0.943) | (0.672) | (0.751) |
| | 2900 | 2900 | 2900 | 2677 | 1739 | 3227 | 3227 | 3227 | 3006 | 1997 |
| **Number of student computers** | 0.574 | 0.466 | -0.376 | 1.051 | 1.373 | -3.446 | -3.948 | -4.620 | -3.527 | -3.434 |
| | (1.291) | (1.641) | (1.956) | (1.797) | (1.773) | (1.510)** | (1.826)** | (2.236)** | (2.280) | (1.989)* |
| | 2534 | 2534 | 2534 | 1381 | 1508 | 2876 | 2876 | 2876 | 1639 | 1809 |

Notes: This table reports the effects of extra resources to school committee on 2009 aggregate infrastructure indices for 2nd cycle schools according to community engagement. Schools where PTA meetings happen at least 3 times a year and parents organize community activities are defined as schools with a more engaged community. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.19: Effect on detailed infrastructure items by community engagement, 1st cycle schools**

| | Less community engagement | | | | | More community engagement | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel A: Interviewer´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **Roof** | | | | | | | | | | |
| | -0.188 | -0.353 | -0.285 | -0.320 | -0.277 | -0.019 | -0.050 | -0.057 | -0.027 | -0.041 |
| | (0.101)* | (0.131)*** | (0.160)* | (0.132)** | (0.151)* | (0.096) | (0.116) | (0.141) | (0.139) | (0.153) |
| | 7497 | 7497 | 7497 | 5572 | 4299 | 6822 | 6822 | 6822 | 4650 | 3977 |
| **Building entrance** | | | | | | | | | | |
| | -0.180 | -0.363 | -0.505 | -0.448 | -0.451 | 0.142 | 0.150 | 0.167 | 0.065 | 0.189 |
| | (0.099)* | (0.130)*** | (0.161)*** | (0.151)*** | (0.150)*** | (0.097) | (0.117) | (0.142) | (0.163) | (0.152) |
| | 7420 | 7420 | 7420 | 4212 | 4262 | 6770 | 6770 | 6770 | 3254 | 3965 |
| **Classrooms** | | | | | | | | | | |
| | -0.137 | -0.271 | -0.344 | -0.500 | -0.499 | 0.143 | 0.172 | 0.041 | -0.193 | 0.017 |
| | (0.100) | (0.130)** | (0.158)** | (0.175)*** | (0.149)*** | (0.100) | (0.130)** | (0.158)** | (0.175)*** | (0.152) |
| | 7217 | 7217 | 7217 | 3155 | 4130 | 6643 | 6643 | 6643 | 2697 | 3888 |
| **Toilets** | | | | | | | | | | |
| | -0.240 | -0.458 | -0.460 | -0.392 | -0.425 | -0.054 | -0.073 | -0.185 | -0.125 | -0.152 |
| | (0.098)** | (0.129)*** | (0.156)*** | (0.121)*** | (0.147)*** | (0.097) | (0.117) | (0.142) | (0.119) | (0.154) |
| | 7342 | 7342 | 7342 | 5976 | 4217 | 6733 | 6733 | 6733 | 5641 | 3942 |
| **Plumbing installations** | | | | | | | | | | |
| | -0.159 | -0.375 | -0.458 | -0.512 | -0.438 | 0.020 | 0.038 | -0.024 | -0.035 | -0.005 |
| | (0.100) | (0.131)*** | (0.160)*** | (0.168)*** | (0.151)*** | (0.098) | (0.119) | (0.145) | (0.168) | (0.159) |
| | 7348 | 7348 | 7348 | 3601 | 4223 | 6729 | 6729 | 6729 | 3450 | 3936 |
| Equipment Infrastructure: | | | | | | | | | | |
| **television** | | | | | | | | | | |
| | 0.044 | 0.104 | 0.163 | 0.138 | 0.139 | 0.126 | 0.166 | 0.230 | 0.150 | 0.184 |
| | (0.105) | (0.137) | (0.167) | (0.177) | (0.158) | (0.094) | (0.114) | (0.138)* | (0.165) | (0.151) |
| | 7643 | 7643 | 7643 | 3525 | 4375 | 7005 | 7005 | 7005 | 3422 | 4091 |
| **parabolic antenna** | | | | | | | | | | |
| | -0.084 | -0.166 | -0.164 | -0.144 | -0.204 | -0.019 | 0.018 | -0.015 | -0.057 | 0.039 |
| | (0.096) | (0.127) | (0.156) | (0.113) | (0.148) | (0.093) | (0.112) | (0.137) | (0.115) | (0.150) |
| | 7170 | 7170 | 7170 | 6325 | 4105 | 6583 | 6583 | 6583 | 5472 | 3814 |
| **video projector** | | | | | | | | | | |
| | 0.063 | 0.109 | 0.103 | 0.134 | 0.153 | 0.030 | 0.023 | 0.156 | 0.146 | -0.027 |
| | (0.101) | (0.131) | (0.163) | (0.128) | (0.150) | (0.102) | (0.122) | (0.148) | (0.136) | (0.161) |
| | 6867 | 6867 | 6867 | 5194 | 3946 | 6304 | 6304 | 6304 | 4699 | 3669 |
| **printing machine** | | | | | | | | | | |
| | 0.324 | 0.263 | 0.119 | 0.198 | 0.176 | -0.013 | -0.007 | 0.065 | -0.105 | -0.074 |
| | (0.101)*** | (0.132)** | (0.162) | (0.145) | (0.154) | (0.089) | (0.108) | (0.132) | (0.136) | (0.140) |
| | 7454 | 7454 | 7454 | 4795 | 4271 | 6847 | 6847 | 6847 | 4173 | 3995 |
| **computer** | | | | | | | | | | |
| | 0.247 | 0.225 | 0.280 | 0.263 | 0.291 | 0.012 | 0.113 | 0.203 | 0.224 | 0.195 |
| | (0.104)** | (0.135)* | (0.166)* | (0.170) | (0.155)* | (0.090) | (0.109) | (0.132) | (0.148) | (0.140) |
| | 7482 | 7482 | 7482 | 3798 | 4284 | 6907 | 6907 | 6907 | 3676 | 4021 |

Notes: This table reports the effects of extra resources to school committee on 2009 detailed infrastructure indices for 1st cycle schools according to community engagement. Schools where PTA meetings happen at least 3 times a year and parents organize community activities are defined as schools with a more engaged community. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 2.19: Effect on detailed infrastructure items by community engagement, 1st cycle schools (continued)**

| | Less community engagement | | | | | More community engagement | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Panel B: Principal´s survey: | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **sport court** | | | | | | | | | | |
| | -0.063 | -0.082 | -0.175 | 0.014 | -0.020 | 0.227 | 0.216 | 0.134 | 0.165 | 0.198 |
| | (0.069) | (0.088) | (0.105)* | (0.116) | (0.105) | (0.073)*** | (0.088)** | (0.106) | (0.123) | (0.117)* |
| | 7513 | 7513 | 7513 | 3527 | 4284 | 6501 | 6501 | 6501 | 3442 | 3818 |
| **laboratory** | | | | | | | | | | |
| | 0.118 | 0.078 | 0.027 | 0.123 | 0.129 | 0.236 | 0.268 | 0.193 | 0.159 | 0.250 |
| | (0.086) | (0.109) | (0.130) | (0.137) | (0.129) | (0.098)** | (0.118)** | (0.143) | (0.168) | (0.156) |
| | 7517 | 7517 | 7517 | 3941 | 4292 | 6498 | 6498 | 6498 | 3285 | 3815 |
| Equipment Infrastructure: | | | | | | | | | | |
| **computer for students** | | | | | | | | | | |
| | 0.121 | 0.064 | 0.030 | 0.087 | 0.171 | 0.028 | -0.036 | -0.173 | -0.164 | -0.216 |
| | (0.088) | (0.112) | (0.133) | (0.116) | (0.131) | (0.089) | (0.106) | (0.129) | (0.123) | (0.139) |
| | 7559 | 7559 | 7559 | 5569 | 4309 | 6543 | 6543 | 6543 | 4575 | 3830 |
| **internet for students** | | | | | | | | | | |
| | 0.121 | 0.075 | 0.029 | 0.027 | 0.193 | 0.145 | 0.163 | 0.128 | 0.097 | 0.119 |
| | (0.086) | (0.110) | (0.131) | (0.108) | (0.129) | (0.089) | (0.107) | (0.130) | (0.120) | (0.141) |
| | 7541 | 7541 | 7541 | 5984 | 4296 | 6540 | 6540 | 6540 | 4813 | 3824 |
| **computer for teachers** | | | | | | | | | | |
| | 0.214 | 0.304 | 0.282 | 0.335 | 0.442 | 0.116 | 0.100 | 0.083 | 0.144 | 0.075 |
| | (0.094)** | (0.120)** | (0.143)** | (0.123)*** | (0.143)*** | (0.093) | (0.111) | (0.135) | (0.126) | (0.147) |
| | 7552 | 7552 | 7552 | 5720 | 4317 | 6545 | 6545 | 6545 | 4812 | 3835 |
| **internet for teachers** | | | | | | | | | | |
| | 0.336 | 0.343 | 0.366 | 0.486 | 0.593 | 0.085 | 0.026 | 0.107 | 0.151 | 0.168 |
| | (0.093)*** | (0.119)*** | (0.142)*** | (0.126)*** | (0.141)*** | (0.092) | (0.110) | (0.134) | (0.127) | (0.144) |
| | 7541 | 7541 | 7541 | 5443 | 4308 | 6527 | 6527 | 6527 | 4645 | 3818 |
| **computer for adm staff** | | | | | | | | | | |
| | 0.115 | 0.124 | 0.096 | 0.177 | 0.231 | 0.202 | 0.208 | 0.274 | 0.111 | 0.203 |
| | (0.096) | (0.122) | (0.146) | (0.162) | (0.142) | (0.093)** | (0.112)* | (0.136)** | (0.161) | (0.146) |
| | 7553 | 7553 | 7553 | 3384 | 4304 | 6532 | 6532 | 6532 | 3058 | 3817 |

Notes: This table reports the effects of extra resources to school committee on 2009 detailed infrastructure indices for 1st cycle schools according to community engagement. Schools where PTA meetings happen at least 3 times a year and parents organize community activities are defined as schools with a more engaged community. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

## Table A.2.1: Effect on disaggregate infrastructure indices, 2009

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **Panel A: Interviewer view** | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **Floor** | | | | | | | | | | |
| | 0.043 | -0.036 | -0.089 | -0.053 | -0.140 | -0.009 | 0.051 | -0.032 | 0.070 | 0.074 |
| | (0.065) | (0.081) | (0.096) | (0.094) | (0.101) | (0.130) | (0.165) | (0.197) | (0.163) | (0.187) |
| | 15,119 | 15,119 | 15,119 | 9,900 | 8,769 | 6,393 | 6,393 | 6,393 | 4,899 | 3,860 |
| **Wall** | | | | | | | | | | |
| | 0.078 | 0.068 | 0.004 | -0.063 | -0.058 | 0.092 | 0.026 | 0.004 | 0.028 | 0.117 |
| | (0.067) | (0.083) | (0.099) | (0.107) | (0.103) | (0.129) | (0.163) | (0.193) | (0.162) | (0.183) |
| | 15,247 | 15,247 | 15,247 | 8,435 | 8,844 | 6,428 | 6,428 | 6,428 | 4,882 | 3,879 |
| **Schoolyard** | | | | | | | | | | |
| | -0.010 | -0.062 | -0.095 | -0.173 | -0.128 | 0.046 | 0.235 | 0.121 | 0.189 | 0.151 |
| | (0.065) | (0.080) | (0.095) | (0.104)* | (0.100) | (0.127) | (0.160) | (0.192) | (0.169) | (0.181) |
| | 15,022 | 15,022 | 15,022 | 8,222 | 8,715 | 6,353 | 6,353 | 6,353 | 4,334 | 3,839 |
| **Hallway** | | | | | | | | | | |
| | 0.034 | 0.017 | -0.089 | -0.181 | -0.060 | 0.164 | 0.316 | 0.030 | 0.222 | 0.085 |
| | (0.065) | (0.080) | (0.095) | (0.107)* | (0.099) | (0.127) | (0.162)* | (0.190) | (0.170) | (0.182) |
| | 14,706 | 14,706 | 14,706 | 7,555 | 8,511 | 6,240 | 6,240 | 6,240 | 4,554 | 3,761 |
| **Kitchen** | | | | | | | | | | |
| | 0.033 | 0.037 | -0.013 | -0.055 | -0.017 | 0.075 | 0.176 | 0.170 | 0.093 | 0.183 |
| | (0.065) | (0.081) | (0.096) | (0.137) | (0.100) | (0.127) | (0.162) | (0.193) | (0.175) | (0.182) |
| | 14,905 | 14,905 | 14,905 | 4,907 | 8,644 | 6,279 | 6,279 | 6,279 | 4,114 | 3,789 |
| **Doors** | | | | | | | | | | |
| | 0.006 | -0.056 | -0.063 | -0.084 | -0.037 | 0.059 | 0.044 | 0.022 | -0.127 | 0.039 |
| | (0.067) | (0.082) | (0.098) | (0.108) | (0.103) | (0.128) | (0.164) | (0.195) | (0.206) | (0.184) |
| | 15,118 | 15,118 | 15,118 | 8,127 | 8,760 | 6,407 | 6,407 | 6,407 | 3,067 | 3,872 |
| **Windows** | | | | | | | | | | |
| | -0.009 | -0.034 | -0.060 | -0.006 | -0.047 | -0.024 | -0.090 | 0.002 | 0.017 | -0.014 |
| | (0.064) | (0.080) | (0.095) | (0.085) | (0.099) | (0.125) | (0.160) | (0.190) | (0.191) | (0.182) |
| | 15,056 | 15,056 | 15,056 | 11,206 | 8,738 | 6,385 | 6,385 | 6,385 | 3,524 | 3,865 |
| **Electrical installations** | | | | | | | | | | |
| | -0.023 | -0.076 | -0.120 | -0.154 | -0.158 | 0.110 | 0.213 | 0.236 | 0.413 | 0.221 |
| | (0.067) | (0.083) | (0.099) | (0.135) | (0.105) | (0.129) | (0.166) | (0.195) | (0.243)* | (0.185) |
| | 14,990 | 14,990 | 14,990 | 5,368 | 8,676 | 6,329 | 6,329 | 6,329 | 2,344 | 3,822 |
| Equipment Infrastructure: | | | | | | | | | | |
| **copy machine** | | | | | | | | | | |
| | 0.079 | 0.032 | -0.111 | -0.047 | -0.009 | -0.049 | -0.058 | -0.171 | -0.206 | -0.121 |
| | (0.062) | (0.076) | (0.091) | (0.090) | (0.095) | (0.121) | (0.150) | (0.179) | (0.185) | (0.168) |
| | 14,674 | 14,674 | 14,674 | 9,319 | 8,505 | 6,233 | 6,233 | 6,233 | 3,217 | 3,756 |
| **VHS** | | | | | | | | | | |
| | 0.178 | 0.148 | 0.124 | 0.144 | 0.110 | 0.019 | 0.075 | -0.051 | 0.025 | 0.080 |
| | (0.066)*** | (0.081)* | (0.096) | (0.091) | (0.101) | (0.128) | (0.161) | (0.191) | (0.206) | (0.185) |
| | 14,980 | 14,980 | 14,980 | 10,127 | 8,660 | 6,334 | 6,334 | 6,334 | 3,058 | 3,837 |
| **mimeo** | | | | | | | | | | |
| | 0.067 | 0.036 | 0.065 | 0.066 | 0.037 | 0.105 | 0.130 | 0.023 | 0.115 | 0.151 |
| | (0.067) | (0.082) | (0.097) | (0.086) | (0.100) | (0.131) | (0.165) | (0.199) | (0.174) | (0.187) |
| | 15,224 | 15,224 | 15,224 | 11,605 | 8,803 | 6,382 | 6,382 | 6,382 | 4,599 | 3,855 |
| **slide projector** | | | | | | | | | | |
| | 0.047 | -0.022 | -0.086 | -0.072 | -0.042 | 0.006 | -0.061 | -0.008 | -0.002 | 0.106 |
| | (0.056) | (0.068) | (0.082) | (0.081) | (0.086) | (0.119) | (0.148) | (0.177) | (0.161) | (0.169) |
| | 14,731 | 14,731 | 14,731 | 9,449 | 8,538 | 6,283 | 6,283 | 6,283 | 4,223 | 3,809 |
| **sound machine** | | | | | | | | | | |
| | 0.094 | 0.014 | -0.024 | -0.039 | -0.027 | -0.134 | 0.120 | 0.103 | 0.061 | 0.061 |
| | (0.067) | (0.082) | (0.098) | (0.124) | (0.102) | (0.128) | (0.160) | (0.190) | (0.176) | (0.180) |
| | 15,256 | 15,256 | 15,256 | 6,042 | 8,823 | 6,440 | 6,440 | 6,440 | 4,214 | 3,891 |

Notes: This table reports the effects of extra resources to school committee on detailed infrastructure indices that are were not reported on Table 11. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.2.1: Effect on disaggregate infrastructure indices, 2009 (continued)**

| | 1st cycle schools | | | | | 2nd cycle schools | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **Panel B: Principal view** | | | | | | | | | | |
| Physical Infrastructure: | | | | | | | | | | |
| **library** | | | | | | | | | | |
| | 0.027 | 0.034 | 0.012 | 0.013 | 0.071 | 0.086 | -0.025 | 0.016 | 0.015 | -0.052 |
| | (0.055) | (0.067) | (0.080) | (0.080) | (0.083) | (0.106) | (0.129) | (0.158) | (0.139) | (0.147) |
| | 14,469 | 14,469 | 14,469 | 9,206 | 8,365 | 5,858 | 5,858 | 5,858 | 4,207 | 3,533 |
| **amphitheater** | | | | | | | | | | |
| | 0.019 | 0.020 | -0.003 | -0.054 | -0.067 | -0.064 | -0.045 | -0.053 | -0.047 | -0.037 |
| | (0.053) | (0.065) | (0.077) | (0.087) | (0.083) | (0.092) | (0.113) | (0.135) | (0.148) | (0.126) |
| | 14,566 | 14,566 | 14,566 | 7,848 | 8,431 | 5,861 | 5,861 | 5,861 | 2,729 | 3,532 |
| **music room** | | | | | | | | | | |
| | 0.043 | 0.040 | -0.058 | -0.062 | -0.031 | -0.076 | -0.144 | -0.103 | -0.036 | -0.081 |
| | (0.067) | (0.082) | (0.098) | (0.114) | (0.104) | (0.120) | (0.147) | (0.175) | (0.210) | (0.169) |
| | 14,558 | 14,558 | 14,558 | 6,981 | 8,424 | 5,849 | 5,849 | 5,849 | 2,472 | 3,509 |
| **art room** | | | | | | | | | | |
| | 0.143 | 0.134 | -0.019 | 0.010 | 0.057 | -0.021 | 0.174 | 0.107 | 0.183 | 0.180 |
| | (0.061)** | (0.075)* | (0.089) | (0.102) | (0.094) | (0.109) | (0.134) | (0.160) | (0.145) | (0.152) |
| | 14,581 | 14,581 | 14,581 | 7,143 | 8,433 | 5,862 | 5,862 | 5,862 | 4,020 | 3,526 |
| Equipment Infrastructure: | | | | | | | | | | |
| **educative DVDs** | | | | | | | | | | |
| | 0.125 | 0.104 | 0.060 | 0.037 | 0.013 | 0.068 | -0.107 | -0.153 | 0.065 | -0.032 |
| | (0.068)* | (0.083) | (0.099) | (0.083) | (0.105) | (0.124) | (0.152) | (0.186) | (0.227) | (0.171) |
| | 14,533 | 14,533 | 14,533 | 12,067 | 8,402 | 5,856 | 5,856 | 5,856 | 2,176 | 3,530 |
| **leisure DVDs** | | | | | | | | | | |
| | 0.179 | 0.129 | 0.041 | 0.046 | 0.066 | 0.163 | 0.183 | 0.220 | 0.153 | 0.331 |
| | (0.066)*** | (0.081) | (0.096) | (0.099) | (0.101) | (0.122) | (0.149) | (0.179) | (0.151) | (0.170)* |
| | 14,381 | 14,381 | 14,381 | 8,696 | 8,300 | 5,770 | 5,770 | 5,770 | 4,385 | 3,469 |
| **copy machine** | | | | | | | | | | |
| | 0.117 | 0.051 | -0.065 | 0.042 | 0.107 | -0.093 | -0.054 | -0.093 | -0.199 | -0.170 |
| | (0.063)* | (0.077) | (0.091) | (0.070) | (0.096) | (0.113) | (0.139) | (0.169) | (0.179) | (0.159) |
| | 14,230 | 14,230 | 14,230 | 13,239 | 8,231 | 5,701 | 5,701 | 5,701 | 2,934 | 3,432 |
| **slides projector** | | | | | | | | | | |
| | 0.029 | -0.038 | -0.049 | -0.037 | -0.051 | 0.071 | 0.167 | 0.291 | 0.359 | 0.293 |
| | (0.053) | (0.065) | (0.077) | (0.076) | (0.080) | (0.111) | (0.136) | (0.165)* | (0.191)* | (0.155)* |
| | 14,384 | 14,384 | 14,384 | 9,260 | 8,313 | 5,813 | 5,813 | 5,813 | 2,580 | 3,502 |
| **video projector** | | | | | | | | | | |
| | 0.041 | -0.023 | -0.005 | -0.030 | -0.020 | 0.100 | 0.129 | 0.006 | -0.006 | 0.022 |
| | (0.068) | (0.083) | (0.098) | (0.093) | (0.103) | (0.125) | (0.152) | (0.187) | (0.172) | (0.173) |
| | 14,194 | 14,194 | 14,194 | 9,806 | 8,190 | 5,721 | 5,721 | 5,721 | 3,377 | 3,437 |
| **DVD player** | | | | | | | | | | |
| | 0.017 | 0.000 | -0.033 | 0.046 | 0.093 | 0.062 | -0.036 | -0.055 | -0.028 | -0.052 |
| | (0.070) | (0.086) | (0.102) | (0.101) | (0.107) | (0.126) | (0.154) | (0.198) | (0.164) | (0.178) |
| | 14,306 | 14,306 | 14,306 | 9,224 | 8,255 | 5,766 | 5,766 | 5,766 | 4,107 | 3,484 |
| **TV** | | | | | | | | | | |
| | 0.052 | 0.035 | 0.013 | 0.030 | 0.117 | 0.185 | 0.193 | 0.241 | 0.306 | 0.244 |
| | (0.070) | (0.086) | (0.102) | (0.087) | (0.109) | (0.129) | (0.158) | (0.192) | (0.207) | (0.183) |
| | 14,446 | 14,446 | 14,446 | 11,835 | 8,364 | 5,832 | 5,832 | 5,832 | 2,853 | 3,511 |
| **sound machine** | | | | | | | | | | |
| | 0.071 | 0.030 | 0.030 | 0.090 | 0.069 | -0.018 | -0.145 | -0.292 | -0.145 | -0.126 |
| | (0.067) | (0.082) | (0.098) | (0.127) | (0.104) | (0.124) | (0.151) | (0.185) | (0.189) | (0.176) |
| | 14,480 | 14,480 | 14,480 | 5,686 | 8,371 | 5,855 | 5,855 | 5,855 | 3,195 | 3,540 |
| **printing machine** | | | | | | | | | | |
| | 0.100 | 0.140 | 0.094 | 0.152 | 0.184 | -0.069 | 0.002 | 0.054 | 0.127 | 0.079 |
| | (0.068) | (0.083)* | (0.098) | (0.113) | (0.104)* | (0.128) | (0.158) | (0.189) | (0.199) | (0.178) |
| | 14,315 | 14,315 | 14,315 | 6,920 | 8,254 | 5,729 | 5,729 | 5,729 | 2,881 | 3,453 |
| **parabolic antenna** | | | | | | | | | | |
| | 0.011 | -0.008 | -0.071 | -0.062 | -0.012 | 0.195 | 0.302 | 0.135 | 0.253 | 0.241 |
| | (0.062) | (0.076) | (0.090) | (0.082) | (0.096) | (0.115)* | (0.142)** | (0.170) | (0.142)* | (0.161) |
| | 14,369 | 14,369 | 14,369 | 10,715 | 8,296 | 5,772 | 5,772 | 5,772 | 4,451 | 3,488 |

Notes: This table reports the effects of extra resources to school committee on detailed infrastructure indices that are were not reported on Table 11. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

## Table A.2.2: Effect on 2009 student performance by mother education

| | 1st cycle schools | | | | | | | | | | 2nd cycle schools | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Less educated mothers | | | | | More educated mothers | | | | | Less educated mothers | | | | | More educated mothers | | | | |
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) |
| **Math score (2009)** | 0.007 | 0.036 | 0.081 | 0.020 | 0.068 | -0.040 | 0.013 | -0.056 | 0.014 | -0.008 | -0.007 | 0.025 | -0.018 | -0.005 | -0.003 | 0.048 | 0.060 | 0.023 | 0.001 | -0.002 |
| | (0.031) | (0.037) | (0.045)* | (0.054) | (0.047) | (0.026) | (0.033) | (0.040) | (0.044) | (0.037) | (0.037) | (0.047) | (0.058) | (0.048) | (0.049) | (0.045) | (0.057) | (0.064) | (0.061) | (0.061) |
| | 8166 | 8166 | 8166 | 3483 | 4613 | 8444 | 8444 | 8444 | 3804 | 5021 | 3894 | 3894 | 3894 | 2347 | 2432 | 3695 | 3695 | 3695 | 2188 | 2247 |
| **Portuguese score (2009)** | -0.013 | 0.029 | 0.053 | 0.020 | 0.046 | -0.043 | 0.022 | -0.012 | 0.057 | 0.005 | -0.005 | -0.014 | -0.070 | -0.024 | -0.028 | 0.041 | 0.045 | -0.003 | -0.002 | -0.020 |
| | (0.027) | (0.032) | (0.039) | (0.052) | (0.041) | (0.023)* | (0.030) | (0.036) | (0.043) | (0.034) | (0.037) | (0.047) | (0.059) | (0.046) | (0.048) | (0.046) | (0.058) | (0.065) | (0.064) | (0.063) |
| | 8166 | 8166 | 8166 | 2919 | 4613 | 8444 | 8444 | 8444 | 3174 | 5021 | 3894 | 3894 | 3894 | 2552 | 2432 | 3695 | 3695 | 3695 | 2374 | 2247 |
| **Pass rate (2009)** | 0.052 | -0.025 | -0.584 | -0.588 | -0.433 | 0.112 | -0.365 | 1.269 | 0.392 | 0.178 | -1.449 | -2.248 | -4.274 | -2.911 | -3.265 | -0.610 | 1.155 | 1.442 | 1.187 | 1.953 |
| | (0.628) | (0.754) | (0.909) | (0.853) | (0.988) | (0.475) | (0.601) | (0.746)* | (0.624) | (0.704) | (1.198) | (1.516) | (1.907)** | (1.796) | (1.588)** | (1.495) | (1.855) | (2.144) | (2.204) | (2.026) |
| | 8168 | 8168 | 8168 | 5713 | 4614 | 8444 | 8444 | 8444 | 6166 | 5021 | 3896 | 3896 | 3896 | 1994 | 2433 | 3696 | 3696 | 3696 | 1821 | 2248 |
| **Dropout rate (2009)** | 0.136 | 0.208 | 0.533 | 0.409 | 0.206 | 0.156 | -0.393 | -0.265 | -0.166 | -0.115 | 0.715 | 1.560 | 1.839 | 0.680 | 1.267 | -1.106 | -1.045 | 0.230 | -0.929 | -0.679 |
| | (0.261) | (0.314) | (0.378) | (0.364) | (0.408) | (0.180) | (0.232)* | (0.280) | (0.242) | (0.263) | (0.633) | (0.807)* | (1.018)* | (0.984) | (0.848) | (0.604)* | (0.759) | (0.859) | (0.924) | (0.829) |
| | 8168 | 8168 | 8168 | 5438 | 4614 | 8444 | 8444 | 8444 | 5912 | 5021 | 3896 | 3896 | 3896 | 1910 | 2433 | 3696 | 3696 | 3696 | 1751 | 2248 |

Notes: This table reports the effects of extra resources to school committee on 2009 academic performance according to mother education. A school with more educated mothers have more than 50% of the mothers with al least complete primary cycle. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.2.3: Effect on 2009 student performance by community engagement**

| | 1st cycle schools | | | | | | | | | | 2nd cycle schools | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Less community engagement | | | | | More community engagement | | | | | Less community engagement | | | | | More community engagement | | | | |
| | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) | Linear | Quadratic | Cubic | Opt IK bandwidth | (0.50 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) |
| **Math score (2009)** | -0.022 | 0.059 | -0.002 | 0.051 | 0.050 | 0.025 | 0.038 | 0.039 | -0.006 | 0.019 | 0.025 | 0.025 | 0.007 | 0.017 | 0.007 | 0.014 | 0.049 | -0.007 | -0.011 | 0.000 |
| | (0.028) | (0.036)* | (0.043) | (0.047) | (0.041) | (0.029) | (0.035) | (0.042) | (0.051) | (0.045) | (0.039) | (0.048) | (0.055) | (0.053) | (0.054) | (0.045) | (0.057) | (0.069) | (0.058) | (0.057) |
| | 9611 | 9611 | 9611 | 4144 | 5487 | 8319 | 8319 | 8319 | 3692 | 4880 | 3509 | 3509 | 3509 | 2067 | 2127 | 3772 | 3772 | 3772 | 2270 | 2344 |
| **Portuguese score (2009)** | -0.017 | 0.051 | 0.011 | 0.091 | 0.052 | 0.004 | 0.046 | 0.042 | 0.003 | 0.008 | 0.024 | 0.015 | -0.001 | 0.011 | -0.006 | 0.002 | 0.002 | -0.090 | -0.045 | -0.043 |
| | (0.024) | (0.032) | (0.038) | (0.046)* | (0.036) | (0.026) | (0.031) | (0.038) | (0.050) | (0.040) | (0.040) | (0.048) | (0.056) | (0.054) | (0.054) | (0.045) | (0.057) | (0.070) | (0.056) | (0.058) |
| | 9611 | 9611 | 9611 | 3477 | 5487 | 8319 | 8319 | 8319 | 3106 | 4880 | 3509 | 3509 | 3509 | 2223 | 2127 | 3772 | 3772 | 3772 | 2477 | 2344 |
| **Pass rate (2009)** | 0.113 | -0.862 | -0.160 | -0.360 | -0.083 | -0.317 | -0.150 | 0.226 | -0.594 | -0.962 | -1.909 | -1.494 | -1.691 | -1.931 | -1.908 | -1.003 | -0.305 | -1.781 | -0.716 | -1.106 |
| | (0.549) | (0.706) | (0.855) | (0.734) | (0.833) | (0.513) | (0.624) | (0.760) | (0.698) | (0.808) | (1.323) | (1.600) | (1.855) | (1.865) | (1.773) | (1.414) | (1.761) | (2.151) | (2.189) | (1.816) |
| | 9616 | 9616 | 9616 | 6852 | 5489 | 8319 | 8319 | 8319 | 5953 | 4880 | 3510 | 3510 | 3510 | 1752 | 2127 | 3774 | 3774 | 3774 | 1904 | 2346 |
| **Dropout rate (2009)** | 0.128 | -0.240 | 0.292 | 0.081 | 0.001 | 0.353 | 0.282 | 0.175 | 0.220 | 0.216 | -0.261 | 0.128 | 1.276 | 0.404 | 0.909 | 0.188 | 0.689 | 1.250 | 0.097 | 0.316 |
| | (0.220) | (0.284) | (0.340) | (0.305) | (0.331) | (0.207)* | (0.252) | (0.306) | (0.285) | (0.324) | (0.634) | (0.774) | (0.901) | (0.952) | (0.878) | (0.668) | (0.833) | (1.029) | (1.050) | (0.863) |
| | 9616 | 9616 | 9616 | 6525 | 5489 | 8319 | 8319 | 8319 | 5694 | 4880 | 3510 | 3510 | 3510 | 1682 | 2127 | 3774 | 3774 | 3774 | 1825 | 2346 |

Notes: This table reports the effects of extra resources to school committee on 2009 academic performance variables according to community engagement. Schools where PTA meetings happen at least 3 times a year and parents organize community activities are defined as schools with a more engaged community. The estimates considers RDD. Linear specifications are on comlumns (1) and (6), quadratic specifications are on columns (2) and (7), and cubic specifications results are in columns (3) and (8). Local linear regressions were estimated with Imbens and Kalyanaraman (2009) optimal bandwidth (columns (4) and (9)) and also a 0.5 bandwidth (columns (5) and (10)). Regressions include as controls: regional dummies, number of students, municipal status, percentage of teacher with higher education degree, percentage of teachers with postgraduate degree, percentage of female teachers, percentage of female students, student-teacher ratio and student socioeconomic index. Robust standard errors are in parenthesis. *, **, *** indicate significance at 10%, 5% and 1% levels.

# CHAPTER 3
# School Council Resource Management and School Quality

## 3.1
## Introduction

This chapter investigates whether introducing a school council to manage autonomous resources improve school quality. As previously described, schools with more than 50 students must establish a school council responsible for PDDE resources but smaller schools do not face this obligation. Schools without council receive their PDDE funding through either state or municipal educational secretariat according to their status (public schools may either be controlled by state or municipality). The school principal should inform the local government about the school priorities in order to guide resource allocation. In contrast, schools with council receive funding straight from the federal government and community members are directly responsible for resource administration in those schools.

Comparison among schools with a school council and those without it implies an assessment between two types of decentralization. In schools where budget management is assigned to a community committee, resources are being delivered straight to local beneficiaries. In this situation, all levels of bureaucracy are being bypassed. This is a strong form of decentralization and the rationality for it is that local community has better knowledge of their actual needs and that the decision process is going to be less bureaucratic and less corrupted. In addition, school council empowerment may increase parental engagement in school life.

Nonetheless, these mechanisms are not likely to operate in any context. Our focus is on schools with size near 50 pupils, and this implies essentially rural schools. As argued by Platteau (2008), beneficiaries in real world rural communities may have weak bargaining power due to specific characteristics such as hierarchical and asymmetric relations. Also, low technical skills might be a constraint for participatory project effectiveness. Even so, some school autonomy

reforms in rural contexts have produced positive results. For instance, EDUCO program in El Salvador have largely increased enrollment in rural poor areas and schools from this program where found to have better classroom environment and less teacher absenteeism (Bruns et al. 2011). In Kenya, an intervention that delivered resources for parent-teacher associations to hire local teachers had positive effects on student scores, particularly if PTA members were trained (Duflo et al. 2012).

In the Brazilian context, the introduction of parent participation through school council budget management might have the effect of actually increasing resources that reach schools as a result of less embezzlement of school resources by local bureaucrats. Indeed, Peroni and Adrião (2007) report parent monitoring over PDDE´s expenditure even in schools where parents do not play a central role in deciding budget allocation. Therefore, the introduction of parents in resource management may prevent misuse even if their participation in decision making is limited. In addition, the empowerment of school council might improve community engagement at school, thus increasing parental contribution and demand towards a better school.

These channels may not work if local elite controls the school council decisions and either drive away resources from school or direct resources to investments according to their preferences instead of real community needs. In addition, local community might lack the technical skills required for participation effectiveness. Therefore, to understand whether the school council management improves school quality is a matter of empirical research.

It is also important to investigate how local characteristics are related to program functioning. As described by Peroni and Adrião (2007), schools with previously engaged parents had a higher community participation in the decision process of PDDE´s resource allocation. Unfortunately, there is no measure for previous parent involvement for schools analyzed in this chapter, but we consider a measure for parent education. More skilled parents might not only be more participative at school, but they may also be more prepared to understand program rules and more responsive to program incentives. Therefore, we investigate whether the introduction of school council management is more prosperous in a more schooled community as expected.

In section 3.2, we describe the data and variables used in this study. Section 3.3 exposes the identification strategy and the estimation method. Then, section 3.4 present the results and section 3.5 discuss them.

## 3.2
## Descriptive Statistics

In order to understand the consequences of resource management by community, we used information collected from FNDE (National Fund for Educational Development), which is responsible for operating the Direct Cash to School Program (PDDE). The data provided allow us to identify, besides the amount transferred to each school, which schools have a school committee (known as *Unidade Executora*) to manage autonomous resources.

Since we focus on comparing schools with or without a school committee, our analysis is narrowed to schools with 20-80 students. The infrastructure characteristics of these schools were obtained from the School Census, and the dropout, failure and pass rates were taken from the INEP website.

With the information provided by the School Census, we are able to know which physical infrastructure or equipment items are present at school. A variety of equipment is available on the survey such as TV, DVD player, printing machine, student computers. In terms of physical infrastructure, there is information on the existence of items such as principal office, library (or reading room), computer laboratory and the number of classrooms.

Table 3.1 informs 2007´s general characteristics for schools with 20 to 80 students that receive funding from the PDDE. These schools have an average budget of R$1,209 (approximately, U$604), and nearly half of them constitute a school committee to manage this funding. They are essentially rural and under municipal control. In addition, these schools are over-represented in Northeast region and they have extremely poor conditions in terms of human and physical resources. For instance, only circa 30% of teachers in these schools have a higher education diploma, less than 10% of them have a library, and nearly 11% have computers. On average, the dropout, failure and pass rate are 6.5%, 17.5% and 76% correspondingly.

As in the previous chapter, we follow Kling, Liebman and Katz (2007) to aggregate infrastructure variables in two indicators: physical infrastructure and equipment. Aggregation is interesting to identify effects in the same direction instead of subjectively choosing individual results as the main ones.

## 3.3
## Empirical Framework

### 3.3.1
### Identification Strategy

Within the context of the PDDE, schools with at least 51 students face two modifications. Besides being compelled to constitute a school committee to be responsible for managing resources transferred straight from federal government, schools with more than 50 students experience a sharp increase in the autonomous budget. Therefore, the comparison of schools just below the 51 threshold with those slightly above it allows us to identify the effect of both treatments jointly. If our interest was to estimate the combination of both rules, we would simply explore this regression discontinuity design at the 51 cutoff.

In order to isolate the effect of having a school council to manage autonomous resources from the effect of more resources, we also consider other scenarios where schools are exposed only to a discontinuous increase of funding. The 100 threshold implies just a sharp increase of funding and the same is true at the 51 threshold in more recent years. Nonetheless, some assumptions must be considered so that the income effects in these different cutoffs are comparable.

The comparison of different discontinuities across space or time has been conducted by previous studies, but Grembi, Nannicini and Troiano (2013) provides formalization of the identification assumptions for this approach that they call difference-in-discontinuities design. Their focus is on the difference between two cross-sectional estimators that are in different time periods. Nonetheless, their setup may also be adapted for difference in discontinuities that are in the same point of time.

Using the notation and the structure developed by Grembi, Nannicini and Troiano (2013), we explain our identification strategy. Initially, consider $y_i(1)$ as

the potential outcome if school $i$ is exposed to treatment and $y_i(0)$ as the analogous variable in case of no treatment. In this study, treated schools are those that must have a school council to manage autonomous resources, and this happens if schools have at least 51 students. The variable $\mathrm{d}_i$ indicates whether school $i$ receives treatment so that the value one indicates that school $i$´s size ($n_i$) is equal or higher than 51 pupils ($n_i \geq n_c; n_c = 51$), and the zero denotes the opposite. Hence, the observed outcome for school $i$ is equal to: $y_i = d_i y_i(1) + (1 - d_i) y_i(0)$.

Considering that $z^+ \equiv \lim_{n \to n_c^+} E[z_i/n_i = n]$ and $z^- \equiv \lim_{n \to n_c^-} E[z_i/n_i = n]$, with $z = y(1), y(0), y$, the regression-discontinuity estimator $\widehat{\tau_{RD}} \equiv y^+ - y^-$ would identify the average treatment effect at the cutoff, $E[y(1) - y(0)/n = n_c]$, under certain conditions derived by Hahn et al. (2001) and stated by Grembi et al. (2013). The necessary conditions are that treatment assignment ($\mathrm{d}_i$) must be independent of $[y_i(1) - y_i(0)]$ conditional on $n_i$ near $n_c$, and that potential outcomes must be continuous at the cutoff ($y(1)^+ = y(1)^-$ and $y(0)^+ = y(0)^-$). However, this last assumption is not verified in our study since the 51 threshold is also characterized by a discontinuous increase of autonomous budget. Therefore, the regression-discontinuity estimator previously described will also incorporate a resource effect besides the school council management effect.

Nonetheless, if the confounding effect can be identified in another discontinuity within the same framework, it is possible to subtract the confounding effect from the combined effect previously estimated in order to isolate the treatment effect. Grembi et al. (2013) derives the assumptions under which such a difference-in-discontinuities estimator identifies the treatment effect.

For a different cutoff, $\tilde{n}_c$, we similarly define that $\tilde{z}^+ \equiv \lim_{n \to \tilde{n}_c^+} E[z_i/n_i = n]$ and $\tilde{z}^- \equiv \lim_{n \to \tilde{n}_c^-} E[z_i/n_i = n]$, with $z = y(1), y(0), y$. The difference-in-discontinuities estimator $\widehat{\tau_{DD}} \equiv (y^+ - y^-) - (\tilde{y}^+ - \tilde{y}^-)$ explores sharp variations that happen at different cutoffs. While Grembi et al. (2013) are interested in the same cutoff value at different points of time; we are also interested in different cutoff values at the same time period. As discontinuities representing only a sharp resource increase, we consider the 100 cutoff as well as the 51 cutoff in most recent years.

Following Grembi et al. (2013), there are two identification assumptions necessary for the difference in discontinuities design. The first one is that the confounding effect on potential outcomes must be constant among the different cutoffs considered, that is, $(y(0)^+ - y(0)^-) = (\tilde{y}(0)^+ - \tilde{y}(0)^-)$. This means that observations just above and just below the cutoffs should be on parallel trends. In our study, this assumption implies that the income effect is the same across the different cutoffs analyzed.

The second hypothesis is that the confounding effect does not change in the presence of treatment, more specifically $(y(1)^+ - y(1)^-) = (y(0)^+ - y(0)^-)$. In other words, there should be no interaction between the treatment and the confounding rule. This indicates that the income effect should not vary due to the introduction of school council management.

### 3.3.2
### Estimation

Unlike Grembi et al. (2013), our regression discontinuity framework is characterized by a fuzzy design. If schools above the cutoff were simply constrained to establish a school committee without receiving a sharp increase in resources, we would have a fuzzy-regression discontinuity design since the treatment rule is obligatory above the cutoff but not below it. The estimation would follow:

$$Y_i = \beta_0 + \beta_1 SC_i + f(Z_i) + \varepsilon_i \qquad (3.1)$$

Where $Y_i$ is the school *i*´s outcome; $SC_i$ is a dummy variable indicating whether the school *i* has a school committee; and $f(Z_i)$ is a continuous function of the total number of students at school *i* (forcing variable). Following Hahn et al. (2001), the estimation of equation (1) consider the dummy variable $D_i = I[Z_i \geq 51]$ as an instrument for the endogenous variable$SC_i$.

On the other hand, if schools at the 51 threshold received additional resources without being required to have a school committee, we would also have

a fuzzy design, since the treatment is a continuous variable. The estimation would be analogous to the previous on:

$$Y_i = \beta_0 + \beta_1 R_i + f(Z_i) + \varepsilon_i \qquad (3.2)$$

The only difference is that the treatment variable is $R_i$, the total amount of resources received by school $i$. The dummy variable $D_i = I[Z_i \geq 51]$ would be an instrument for the endogenous variable $R_i$.

Nonetheless, schools with at least 51 students face both treatments. Therefore, whether estimating (3.1) or (3.2), the estimated effect embodies equally the establishment of school council management and the sharp increase of autonomous funding.

As previously explained, in order to disentangle the effect of school council management from the effect of resources, we consider scenarios within the PDDE context where there is only the discontinuous increase in resources, but no changes in other program rules or other policies. If the income effect is similar across these different scenarios and if there is no interaction between the income effect and the school council management effect, then the difference between the estimated effects could be attributable to the fact that schools in one setting are also subjected to adopt school committee management.

To begin with, we explore the fact that schools with 100 students or more face a discontinuous change in the resources received. We estimate equation (3.2) considering the dummy variable $D_i = I[Z_i \geq 100]$ as an instrument for autonomous resources. Although schools around the 100 cutoff are not exactly equal to schools nearby the 51 cutoff, we will argue that the main difference between them is the introduction of school council to manage autonomous resources. Therefore, the difference among the estimated effects by equation (3.2) in both scenarios would be a valid approximation of the effect of school council management.

In addition, we take advantage of the fact that it is increasing the number of smaller schools that choose to adopt school council management, so that, in most recent years, the discontinuity around the 51 threshold in the proportion of schools with a school committee has practically disappeared. Therefore, for recent

years (2011 and 2012), the 51 cutoff denote only a discontinuous increase in resources. This led to the possibility of comparing the effects estimated by equation (3.2) in the previous years (2008-2009) with those of most recent years (2011-2012). If there is not a particular difference among the periods analyzed (that could change results), then the difference in effects could be entitled to the introduction of community on resource management.

Both strategies to isolate the effect of having a school committee to manage autonomous resources have their own caveats. Although schools around the 100 cutoff are to some extent different from schools at the 51 cutoff, they are exposed to the same time period characteristics. It is assumed that resource effect is similar between schools with size close to 100 pupils and schools with size near 50 pupils even though these schools have different characteristics.

On the other hand, schools at the 51 cutoff in another time period have more similar characteristics, but they face differences inherent to their specific time. The assumption needed is that resource effect does not vary with time. In addition, both strategies demand that there is no interaction between school council management effect and resource effect. Results are considered more robust if both strategies point to similar findings.

It is also relevant to remark that our comparison among the three different scenarios is also limited by the fact that each one of three equations estimations estimated considers different instruments. Responsiveness to each instrument might also be different across the three different thresholds being analyzed.

We estimated equation (3.2) by local linear regressions for different bandwidths considering a rectangular kernel as advocated by Lee and Lemieux (2010) and Imbens and Lemieux (2008) for being more transparent. Since the forcing variable (number of students) is discrete, the standard errors are clustered on the school size level as recommended by Lee and Card (2008). Our tables also present results considering a quadratic and a cubic specification.

## 3.4
## Results

In this section, we present the results regarding the different scenarios discussed in the previous section. Initially, the effects are described considering the introduction of school council management combined with a sharp increase of resources. We compare results at the 51-cutoff for 1-year treatment (2008) and for 2-year treatment (2008-09). Subsequently, we introduce findings for a pure resource-policy for a 2-year period. First, the results for schools at the neighborhood of the 100 cutoff (2008-09) are presented, followed by the results for schools near the 51 threshold in most recent years (2011-12). In addition, we also look for heterogeneous effects according to community literacy rate throughout the empirical evidence presented in this section.



### 3.4.1
### The effects of school council management combined with more resources

#### RD Validity

Here we investigate whether the participation of parents on resource management together with additional funding result in better infrastructure quality and student performance. We take advantage of the regression discontinuity design in PDDE due to the fact that schools with at least 51 pupils are obligated to adopt council management and also receive a sharp increase in their autonomous budget.

This rule is perfectly illustrated by Figures 3.1 and 3.2. Figure 3.1 display the percentage of schools with a council responsible for the autonomous budget for each school size in terms of pupils. There is a sharp increase in the probability of having school council management in 2008 when school size exceeded 50 pupils in 2007. Figure 3.2 depicts the total amount transferred by the program PDDE to schools according to their size. It is visible a discontinuous increase on autonomous budget in 2007 when school achieved the 51 pupils in 2007.

Table 3.2 corroborates the discontinuity in the figures through first-stage regressions. Having at least 51 students in 2007 implies an increase of almost R$800 (approximately U$400) and a rise of more than 30 percentage points in the probability of having a school committee at the cutoff (actually, those with more than 51 students will have a school committee, while those just under the 51 cutoff have a probability of nearly 70%). Therefore, this threshold indeed represents both more resources and school council management.

First of all, we discuss some specification checks on the regression discontinuity design recommended by the literature (Lee and Lemieux 2010, Imbens and Lemieux 2008). Since we are interested in schools around the 51 cutoff, we narrow our sample to schools with 20-80 students in 2007. The characteristics of this sample are displayed at Table 3.1.

In order to investigate whether baseline characteristics are balanced at the 51 cutoff, we conduct the estimation of equation (3.2) considering the resources received in 2008 as the endogenous treatment, and the school characteristics in 2007 as outcomes. Table 3.3 presents general school characteristics in 2007, except for the percentage of literate adults in the municipality, which was taken from the 2012 Demographic Census. Several characteristics such as region, percentage of teachers with higher education degree and percentage of female students were not significantly different. Only teacher-student ratio significantly changes at the 51 cutoff. It is worth mentioning that there is no discontinuity for the variable representing the percentage of literacy among adults (more than 30 years), which makes it especially important for us to conduct an investigation of heterogeneous effects considering this variable as an indicator of the educational level of the local community.

Furthermore, Tables 3.4 and 3.5 present evidence of no discontinuity on baseline student performance and on aggregate infrastructure indices, respectively. Tables 3.6 and 3.7 present the estimates for detailed physical infrastructure and equipment items. Only TV and copy machine appears to significantly change at the cutoff. Figure 3.4 presents the analogous graphical analysis for some variables and shows no discontinuities at the cutoff.

If schools could manipulate their student number on School Census survey, then the distribution of schools around the cutoff would not be random. More resources would be an incentive for schools to declare having more students

than they actually have. However, as previously argued, School Census is collected at the student level. This constrains schools to declare the real number of students. Nonetheless, if schools were manipulating their census surveys, we would have found different characteristics between schools at the cutoff. Furthermore, it is also important to inspect the density of the forcing variable to verify sorting around the threshold. Considering Figure 3.3, we see that there is no discontinuity in the distribution of the school size at the cutoff. If schools were choosing which side to be around the cutoff, we would expect to see a discontinuous change in the density at the cutoff.

## Evidence on student performance and infrastructure, 2008 (1-year effect)

In Table 3.8, we see that the combination of more resources and school council management in the period of one year did not result in significantly better student performance. In contrast, Table 3.9 reveals some positive change in the aggregate equipment index, but not in the physical infrastructure index. On average, an increase of R$1000 combined with school council management implied an equipment improvement of 0.025 standard deviations (considering column 6). This constitutes a marginal increase in overall infrastructure quality.

Table 3.10 display no significant change in physical infrastructure items, whereas Table 3.11 indicates an increase in the probability of having DVD player and student computers. Considering the 20 bandwidth, receiving additional R$1000 and introducing school council management increases in 3 and 1.7 percentage points the probability of having DVD player and students computers, correspondingly. Although these effects appear small, it is necessary to consider that the 15.7% and 3.6% of these schools have DVD player and student computers. Therefore, there is an increase of almost 20% and 46% in the probabilities of having each of these devices.

We are also interested in investigating heterogeneous effects according to local settings. Therefore, we separate the sample considering the median of the municipality literacy rate among adults (over 30 years). In Table A.3.1 in the appendix, we see that the null result in student achievement is common to both type of schools here considered. Nonetheless, the immediate positive effects on equipment infrastructure are restricted to schools located in municipalities with

higher percentage of literate adults as shown by tables A.3.2, A.3.3 and A.3.4. Taking into account the 20 bandwidth, an increase of R$1000 combined with school council management leads to an improvement of 0.04 standard deviations on equipment index of schools with a better educated community.

### Evidence on student performance and infrastructure, 2008-09 (2-year effect)

Considering that other effects of the combination of additional resources and school council management might appear after some time, we investigate outcomes after two consecutive years of being exposed to these treatments. Analyzing Table 3.12, we observe that having at least 51 students in 2007 increases the autonomous funding received in 2008-09 on roughly R$950 (U$475) and raise more than 20 percentage points the probability of having a school committee in both 2008 and 2009.

Table 3.13 reveals that schools that had a school committee and received more resources for the past two years exhibit higher pass rate and lower failure and dropout rates. Despite being significantly different from zero, the effects are not sizeable. For instance, considering the 20-bandwidth, an increase of R$1,000, combined with school council management, will lead to an increase of 1.2 p.p. in pass rate, and a reduction of 0.7 p.p. in failure rate and 0.5 p.p. in dropout rate. Looking at Table 3.1, this represent 1.2% increase in pass rate, and 4% decrease in failure rate and 7.8% decrease in dropout rate. That is, all effects are less than 10%.

No effect is obtained for physical infrastructure aggregate index or individual items (see Tables 3.14 and 3.15). On the contrary, there is an improvement in the aggregate equipment index (Table 3.14) and there is an increase in the probability of having several items such as TV, DVD player, and copy machine, printing machine and student computers (Table 3.16). These effects are substantial especially considering that these are very poor schools. As an example, consider the 20 bandwidth, an increase of R$1000 combined with school council management implies an increase of 2.6 p.p. in the probability of having students computers, which means a rise of 25% in this probability. It also implies an additional 1.4 student computers at these schools.

Now we proceed to consider different effects according to local community characteristics. Once again, we separate the sample considering rate of literacy among adults in municipalities. In Table 3.17, we see that the improvement on student performance is concentrated on schools for which local community is better literate.

On the other hand, the upgrading on school equipment index happens in schools either in more educated municipalities or in less educated ones, as illustrated by Table 3.18. The main difference among these schools is that the former seem to invest more on student computers (Table 3.20).

Therefore, the introduction of school councils combined with more resources seems to immediately improve equipment only at schools with better schooled community (in a one year horizon), but, after a short time (2 years), the positive changes in equipment will also happen in schools where community is less educated. It is interesting to note that positive effects on infrastructure due to parent participation in resource management occur even in more disadvantaged communities. Nonetheless, the marginal improvement on student performance is restricted to better-off communities.



## Evidence on student and teacher characteristics, 2008-09 (2-year effect)

In addition, we also consider whether these policies might affect student and teacher characteristics. Table 3.21 reveals an increase in the percentage of teachers with higher education degree and post-graduation diploma in schools that received more resource and adopted school council management. Considering the 20 bandwidth, an additional R$1000, combined with school council management, lead to a rise of 2.4 p.p. in the probability of having a teacher with higher education diploma, and 1.5 p.p. in the chance of having a teacher with postgraduate degree. These results imply increases of 9% and 25% in these probabilities, respectively.

It is important to emphasize that this is not a direct effect of the program, since the autonomous funding must not be used to pay wages or instruction for teachers. Moreover, the school committee is not formally entitled to control school issues other than the management of the autonomous resource. However, the empowerment of the local community to manage resources might result in

higher community pressure to solve other schools problems. This means that the control over autonomous funding might empower parents to demand more qualified teachers.

In principle, this effect could also be explained by teacher sorting. Better qualified teachers might prefer to work in schools with superior infrastructure and this would lead to a rise in the proportion of teachers holding diplomas in schools that witnessed more investments. Nevertheless, if this were the case there is no reason to expect this teacher movement to be more intense in schools with a better educated local community. Both types of schools (with more and a less educated community) receive additional resources and observe improvement on their equipment infrastructure. Table 3.22 indicates that the increase in the proportion of teachers with higher education occurs in schools located in more educated municipalities. This evidence support the previous hypothesis, since the empowerment of parents might be more effective if they have more education.

One might also be worried about student sorting affecting results. Families with stronger preference for education might choose schools with a greater budget and where they can participate in resource management. This could be the reason behind the effects on teacher qualification, infrastructure and student performance. However, this argument loses strength by the fact that our sample comprises essentially rural schools. In the rural context, it is expected that students have little or no mobility. Unfortunately, we are unable to test effects on some student characteristics that would indicate student sorting. The percentage of female student in 2009 is not affected at the cutoff (Table 3.22), which suggest no student sorting.



### 3.4.2
### The effects of a pure resource policy in the period 2008-2009

Now we present the effect of providing more autonomous resources to schools with more than 100 students in 2008 and 2009. Our objective is to isolate the consequences of school council management by comparing the effects of this pure resource-policy with the previous results from a combination of more resources and school council management. Comparing Tables 3.1 and 3.23, we see that schools around the 100 cutoff are to some extent different from schools in

the neighborhood of the 51 threshold. But they are not that different. Schools near the 100 cutoff are also mostly rural and located in the Northeast region. Their overall characteristics are better than the smaller schools at the 50 cutoff, yet they still suffer with poor conditions. Almost 50% of teachers in these schools have a higher education degree, less than 30% of these schools have a library and near 40% have computers. Even though schools at 100-cutoff are better-off compared to schools at 51-cutoff, they are not completely different, given that both groups represent disadvantaged schools.

In Table 3.24, we report the estimated effect of having more than 100 students on total autonomous funding received in the period 2008-09, and on the probability of having schools committee in both years (first-stage regressions). As expected, the 100-cutoff does not affect the chance of a school having a management council (as most of them already have it). The increase in the total funding in nearly R$1,200 (U$600), which is somewhat higher than the increase in the 51-cutoff (R$950 in Table 3.12).

Nevertheless, despite of having different characteristics and experiencing different increases in budget, we consider that the main difference between schools at 51-cutoff and schools at 100-cutoff is that the first group also introduce school council to manage resources. Therefore, we estimate the effect of more resources at the 100-cutoff in order to compare with our previous findings.

## Evidence on student performance, school infrastructure and teacher characteristics

Table 3.25 present evidence of no effect on student performance by the pure-resource policy for schools with approximately 100 students. In addition, Tables 3.26, 3.27 and 3.28 reveal no effect of the additional funding on infrastructure variables from the School Census. We also investigated the possibility of heterogeneous effects according to the education of local community, but no effects were found except for an increase of administrative computers in schools located in less educated municipalities (see Tables A.3.5, A.3.6, A.3.7 and A.3.8). In addition, Table 3.29 indicates that there is not an increase in the percentage of more educated teachers in schools that received more resources.

The absence of effects on infrastructure in this context might be explained by the limited information provided by the School Census variables. These variables might not be able to measure the investments made with the additional resources. Nonetheless, these results suggest that more infrastructure improvement was achieved when more resources were combined with establishment of a school council. Actually, the introduction of school council management by itself might imply more resources to school by reducing local capture. This may explain the reason for previous investments being more apparent and able to be captured by School Census variables.

Therefore, a pure-resource policy for schools in the neighborhood of 100 students does not result in the previous findings: better student performance, improved infrastructure and more qualified teachers at school. This constitutes piece of evidence in favor of school council management as being the main responsible for prior outcomes.



### 3.4.3
### The effects of a pure resource policy in the period 2011-2012

Analyzing the data, we observe that there is an increase of the proportion of schools with less than 51 students that have school committee, so that, for most recent years (2011 and 2012), the 51-cutoff does not represent anymore a discontinuity in the percentage of schools with school committee. This means that schools with at least 51 students experiment a discontinuous increase of resources but not a jump in the chance of having school council management of resources in the period 2011-12. We take advantage of this fact in order to compare the effects associated to 51-cutoff through time as another strategy of disentangling the effect of school council management from the effect of additional resources.

The main drawback of this method is that schools in different time period are exposed to different contexts, due to time peculiarities. The advantage is the fact that these schools have similar characteristics, as can be noted from a comparison of Tables 3.1 and 3.30. They are essentially rural and located in Northeast region. Overall, they have a slightly better situation in their infrastructure characteristics, but the difference is even smaller than the one obtained when considering school at 100-cutoff. Schools around the 51-cutoff in

most recent years also have superior student performance, when compared to schools in the neighborhood of 51 students in earlier years.

As previously described, Table 3.31 shows that the 51-cutoff in 2010 does not discontinuously affect the probability of having school committee during 2011-12, but it represents a jump of nearly R$700 (U$350) in the autonomous budget for the same period. The increase in resources is a little smaller than the one experienced in previous years at the 51-cutoff (which was R$950, as shown in Table 3.12). If we consider that school characteristics, time-context and budget increase are not very much different, the main difference among schools near the 51-cutoff in different points in time will be the fact that schools in the first years also experienced a jump in the chance of having a school committee to manage autonomous resources. Therefore, we compare the effects at the 51-cutoff in the periods 2008-09 and 2011-12 as a way to shed some light on the possible consequences of having school council management.



## Evidence on student performance, school infrastructure and teacher characteristics

The results presented in Table 3.32 indicate no or small effect on student performance due to additional resources received in the period 2011-12. In addition to the null result on academic achievement, Table 3.33 suggests no change on infrastructure aggregate indices. However, an investigation of individual infrastructure items conducted in Tables 3.34 and 3.35 indicate that the extra resources were invested in playground. Considering the 20 bandwidth, an additional R$1000 increases by 2 p.p. the probability of having this facility. Bearing in mind that only 6.6% of these schools have it (Table 2.30), this is a relevant effect.

Exploring heterogeneous effects in Tables A.3.9, A.3.10, A.3.11 and A.3.12 in the Appendix, we find that there is a significant reduction of dropout rate in schools located in less educated municipalities, but the expansion of playgrounds was concentrated in schools with a more literate local community.

Table 3.36 displays no changes on teacher characteristics in schools that received more resources. This result, combined with the lack of effect on student performance and equipment infrastructure, suggests that the findings at the 51-

cutoff in the previous years were mainly driven by the adoption of school council management.

## 3.5
## Discussion

The findings of this chapter might be easily summarized through graph analyzes. Figure 3.5 plots several outcomes after controlling for their past values against the school size. The vertical lines represent the thresholds at which there is a discontinuous increase in the budget. The first column (Panel A) represents the 51 cutoff in 2007 that imply not only a jump of resources in the period 2008-09, but also a discontinuous increase in the probability of having school council management during 2008-09. The 100 cutoff in 2007 and the 51 cutoff in 2010 are represented in the second (Panel B) and third (Panel C) columns. These thresholds denote a rise in the autonomous budget of the periods 2008-09 and 2011-12, respectively. A discontinuous increase (decrease) in the outcome values at one of the thresholds indicate that this change is being caused by the treatment associated to that cutoff.

We note that there is a reduction in dropout and failure rates and a rise in pass rate in the first column, though not in the second and third columns. This means that improvement in student achievement do not happen in a context of pure resource policy, and modest academic progress is likely connected to the introduction of school council management.

This same pattern is observed when considering equipment infrastructure (represented by student computers in Figure 3.5), which means that equipment upgrading was also strongly connected to the establishment of school council. The playground variable in Figure 3.5 presents a greater discontinuity in the third column, which suggests that additional resources in 2011-12 were invested in playground.

Figure 3.5 also reveal more intense increase in the percentage of qualified teachers at the cutoff associated to school council management of resources (first column). This implies that changes in the teacher qualification are most likely associated to community empowerment instead of more funding.

Even though the three cutoffs do not represent schools in exactly identical contexts, their comparison provides an interesting exercise to shed some light on the consequences of empowering local community to manage resources. In sum, the combination of additional resources and establishment of a school committee results in better student performance, equipment upgrading and higher percentage of qualified teacher at schools. The fact that these outcomes are not present in the same way, when considering other contexts of pure-resource policy, constitutes evidence that these effects are mostly consequence of the establishment of parent participation in resource management.

The introduction of school council might imply not only a more rational investment according to school needs, but also an increase of school resources by reducing local capture. Delivering resources to direct beneficiaries avoid misuse from school principal or officers at local government. We have discussed that this would be not the case if school council represents interests of a privileged group among community. Nonetheless, we find evidence that community participation improves resource management towards more quality on school infrastructure. In addition, school council management slightly benefits student performance and unexpectedly improves teacher qualification. This last result suggests that empowering parents on resource management might increase their participation and their demands at school.

It is important to note that both better equipment and more educated teacher could represent mechanisms to achieve improvement on academic performance. Therefore, introducing school council management of resources (combined with additional resources) would improve school infrastructure and teacher qualification so that students would achieve better academic indices. Nonetheless, there are other mechanisms that might be acting. As argued before, empowering community to manage resources might actually result in empowering community to take other actions. For instance, parents might demand less absenteeism of teachers or of their children.

In addition, we looked for heterogeneous effects considering local community education. Figure 3.6 illustrates the findings. The first column represents schools in municipalities with lower literacy rate among adults, while the second exhibits schools in municipalities with higher percentage of literate adults. We note that the fall in dropout and failure rates and the rise in pass rates

are more accentuated in the second column. The same pattern is observed for computers and percentage of qualified teachers. Therefore, Figure 3.6 highlights that school council management might improve school infrastructure even in less privileged local context. However, positive outcomes are more intense in better-off communities, especially those related to academic progress and better teacher qualification.

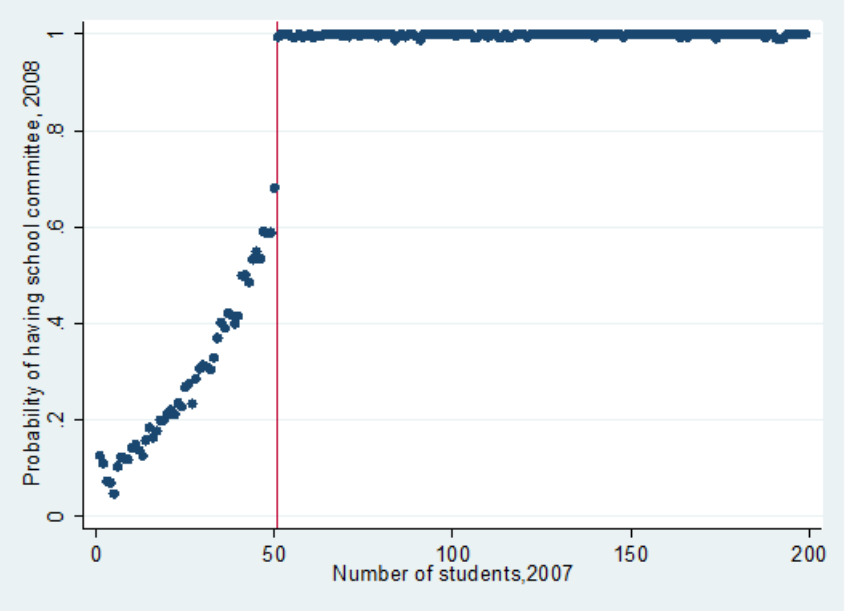


**Figure 3.1: Probability of having school committee, 2008**

Notes: The figure depicts the relationship between having school committee in the Brazilian school autonomy program (PDDE) in 2008 and the school size in 2007. The vertical line represents the 51 cutoff point.

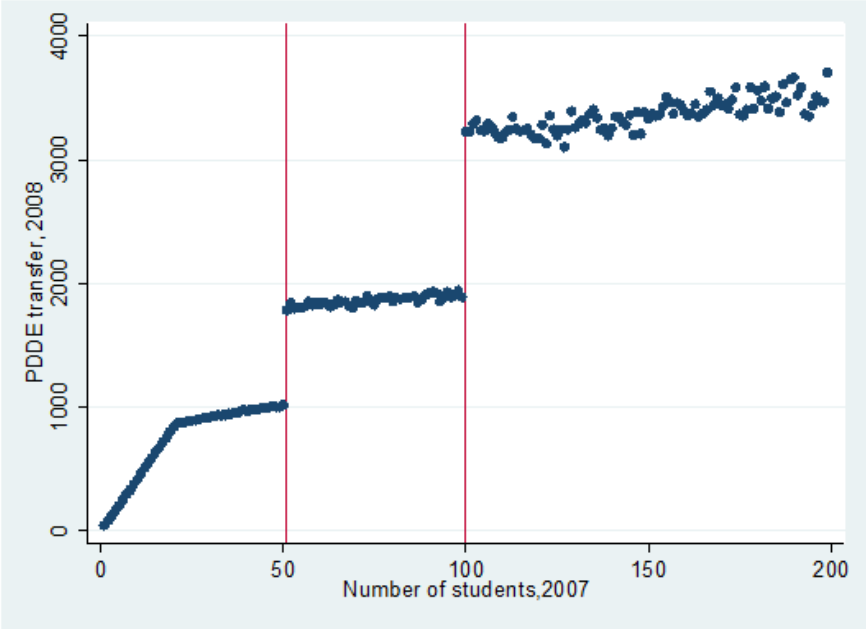


**Figure 3.2: Total autonomous budget, 2008**

Notes: The figure depicts the relationship between the total amount received by schools from the program *Dinheiro Direto na Escola* /PDDE (Program of Cash Direct to Schools) in 2008 and the school size in 2007. The vertical lines represent the 51 and 100 cutoff points.

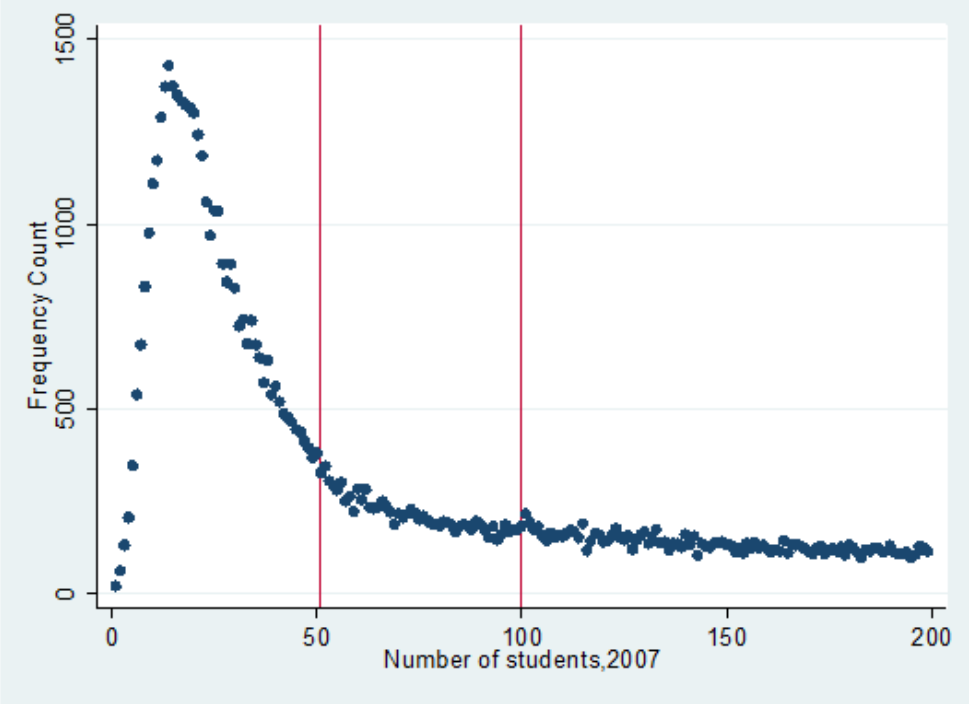


**Figure 3.3: Distribution of the number of students at school in 2007**

Notes: The scatter plots represent the density of the school´s number of students in 2007. It is considered only schools that received autonomous budget from PDDE in 2008. The vertical lines represent the 51 and 100 cutoff points.

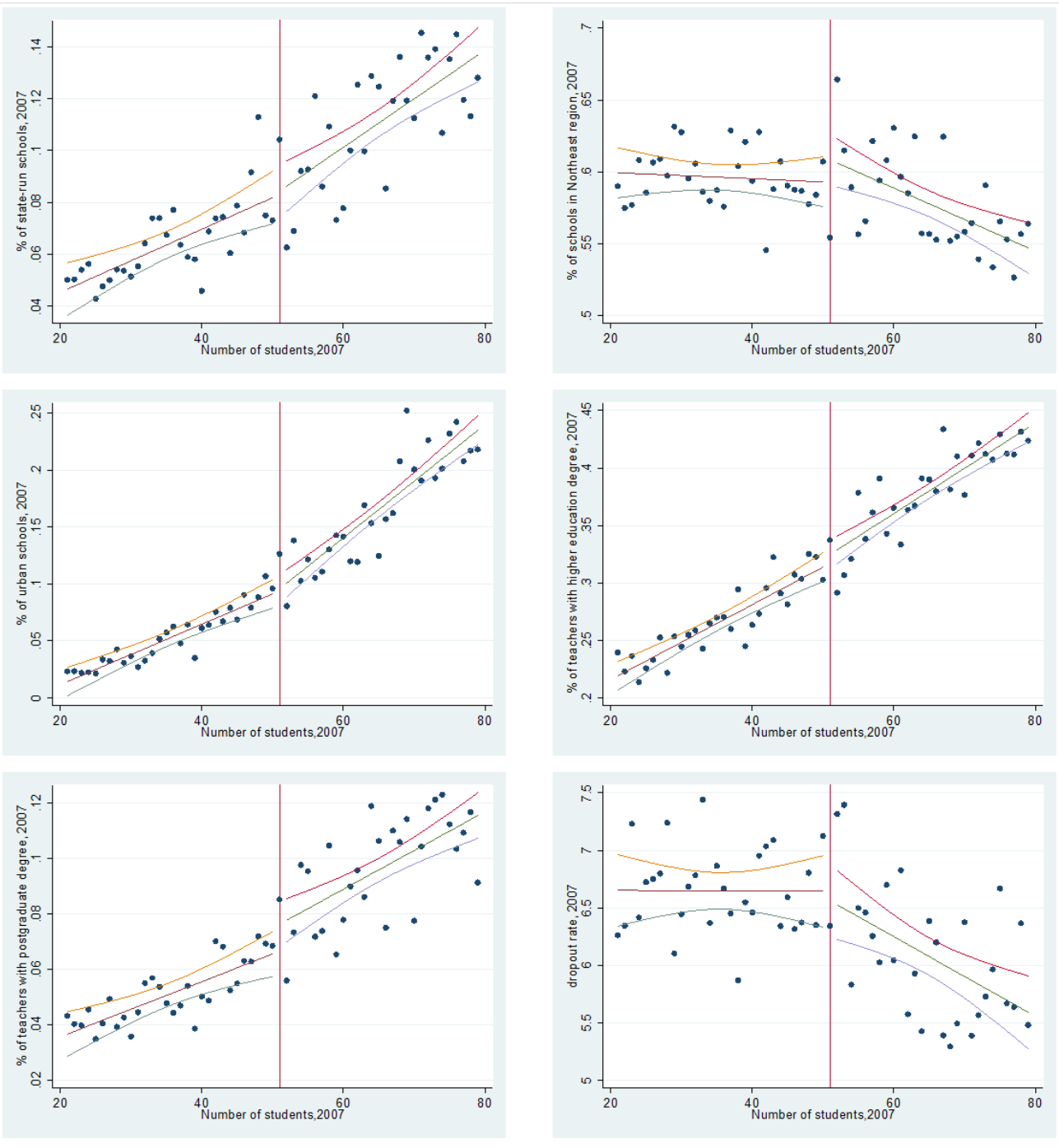


**Figure 3.4: School Characteristics, 2007**

Notes: The figure depicts the relationship of several school characteristics in 2007 and the number of students at school in 2007. The vertical line represents the 51 cutoff.

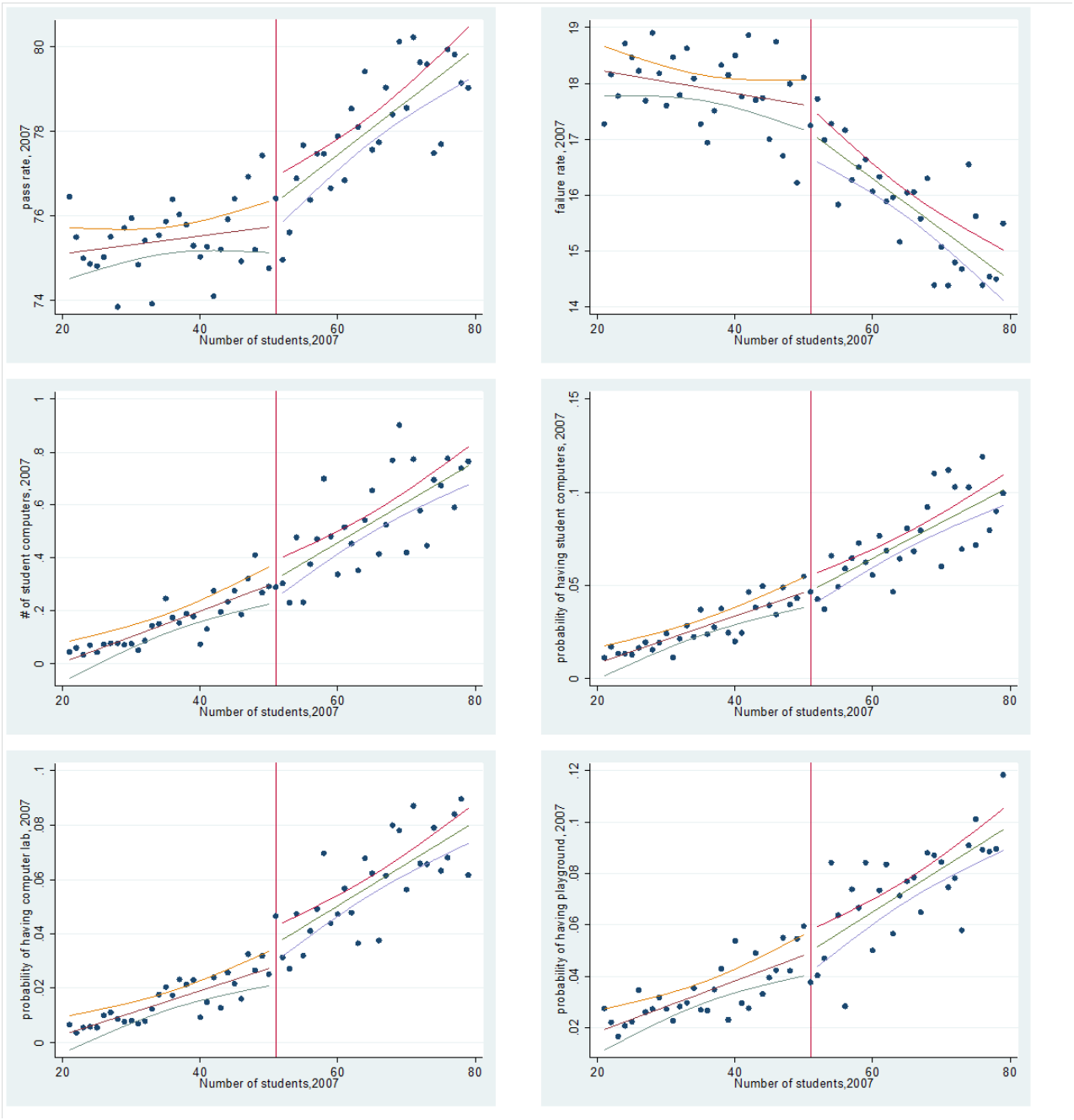


**Figure 3.4: School Characteristics, 2007 (continued)**

Notes: The figure depicts the relationship of several school characteristics in 2007 and the number of students at school in 2007. The vertical line represents the 51 cutoff.

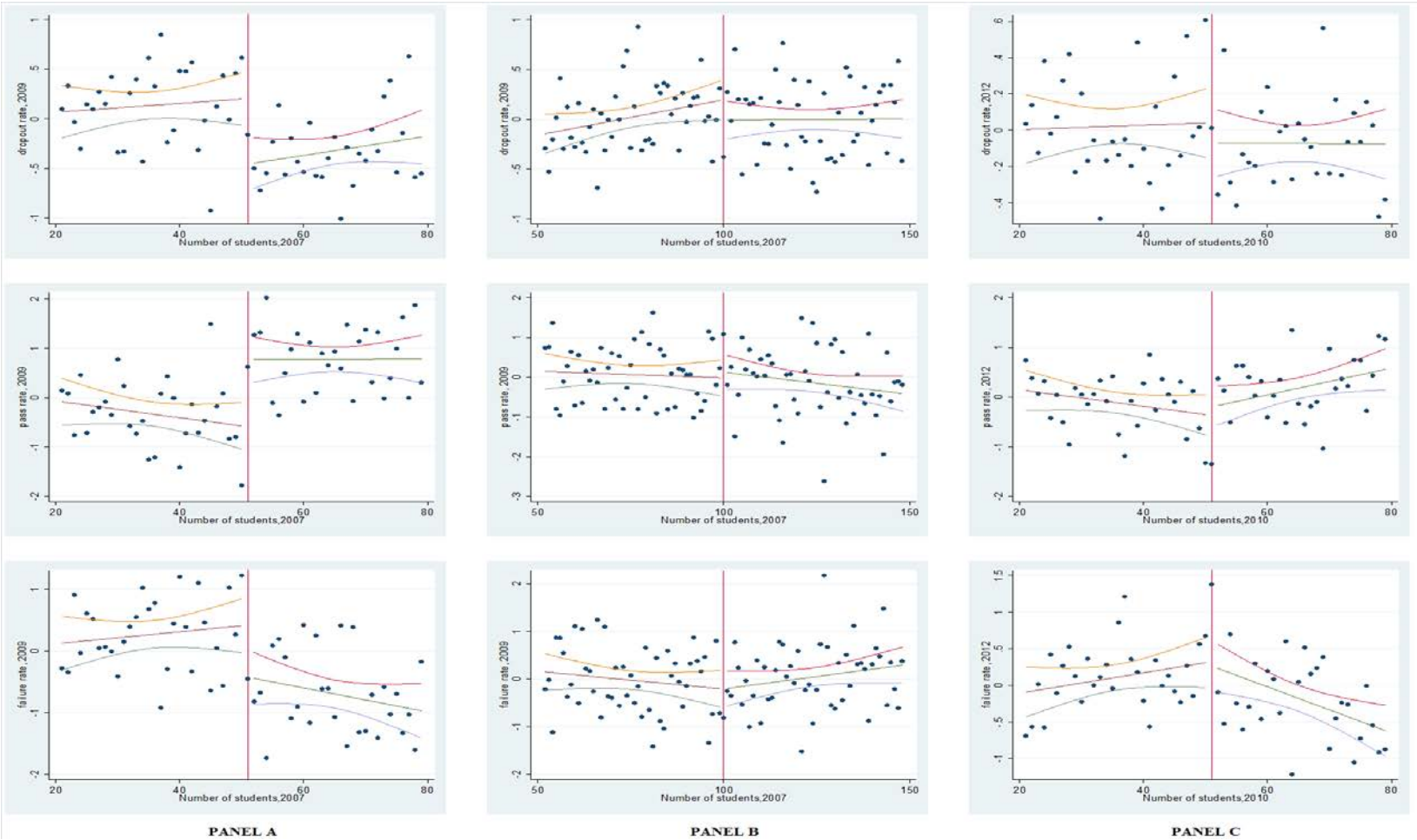


**Figure 3.5: Comparing outcomes at different thresholds**

Notes: The figure depicts the relationship of several outcomes (controlled by their past values) and the number of students at school. The first and second columns consider outcomes at 2009 and school size in 2007. The difference is that the first highlights the 51 cutoff while the second emphasizes the 100 cutoff. The third column represents outcomes in 2012 against the school size in 2010, indicating the 51 cutoff.

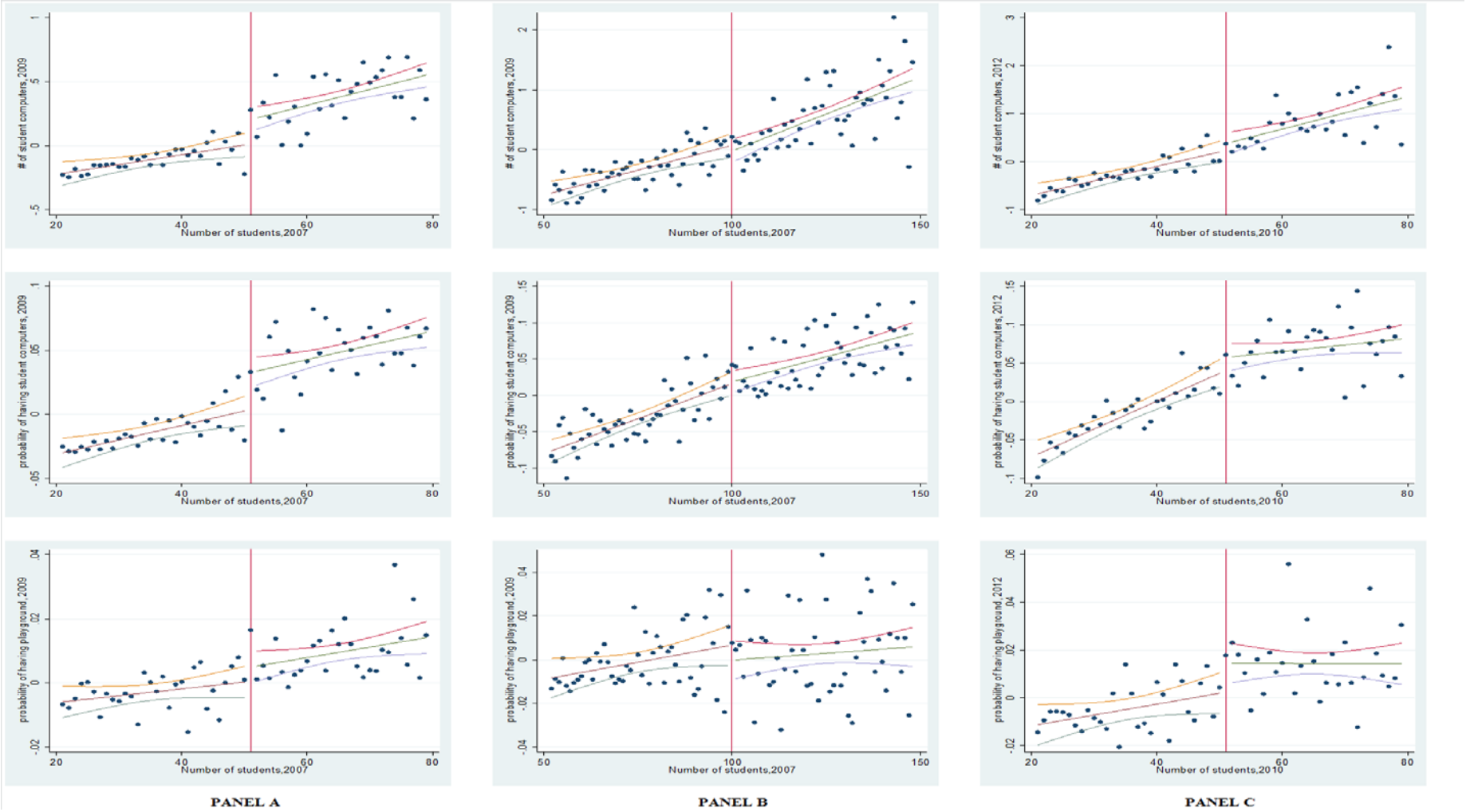


**Figure 3.5: Comparing outcomes at different thresholds (Continued)**

Notes: The figure depicts the relationship of several outcomes (controlled by their past values) and the number of students at school. The first and second columns consider outcomes at 2009 and school size in 2007. The difference is that the first highlights the 51 cutoff while the second emphasizes the 100 cutoff. The third column represents outcomes in 2012 against the school size in 2010, indicating the 51 cutoff.

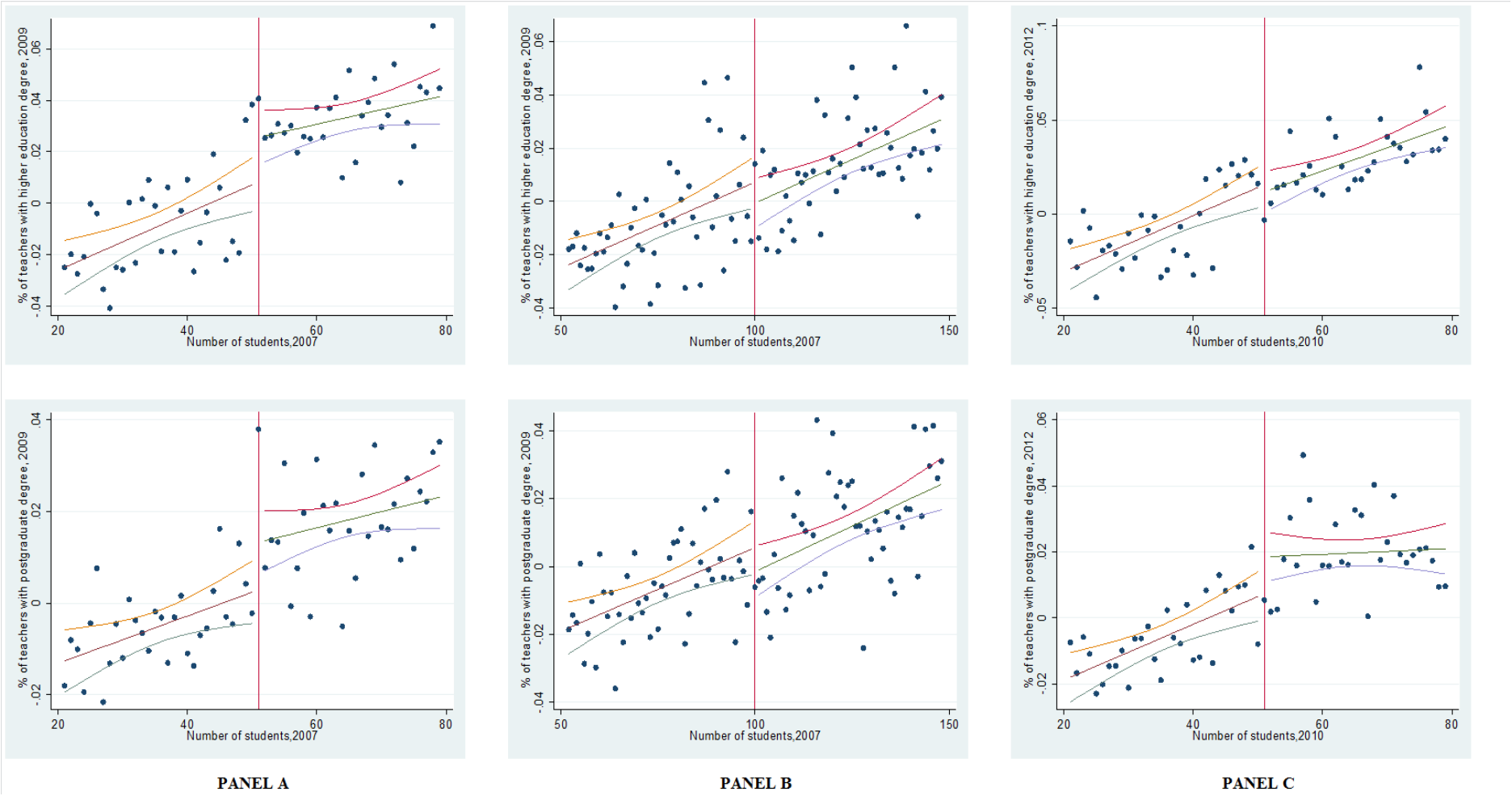


**Figure 3.5: Comparing outcomes at different thresholds (Continued)**

Notes: The figure depicts the relationship of several outcomes (controlled by their past values) and the number of students at school. The first and second columns consider outcomes at 2009 and school size in 2007. The difference is that the first highlights the 51 cutoff while the second emphasizes the 100 cutoff. The third column represents outcomes in 2012 against the school size in 2010, indicating the 51 cutoff.

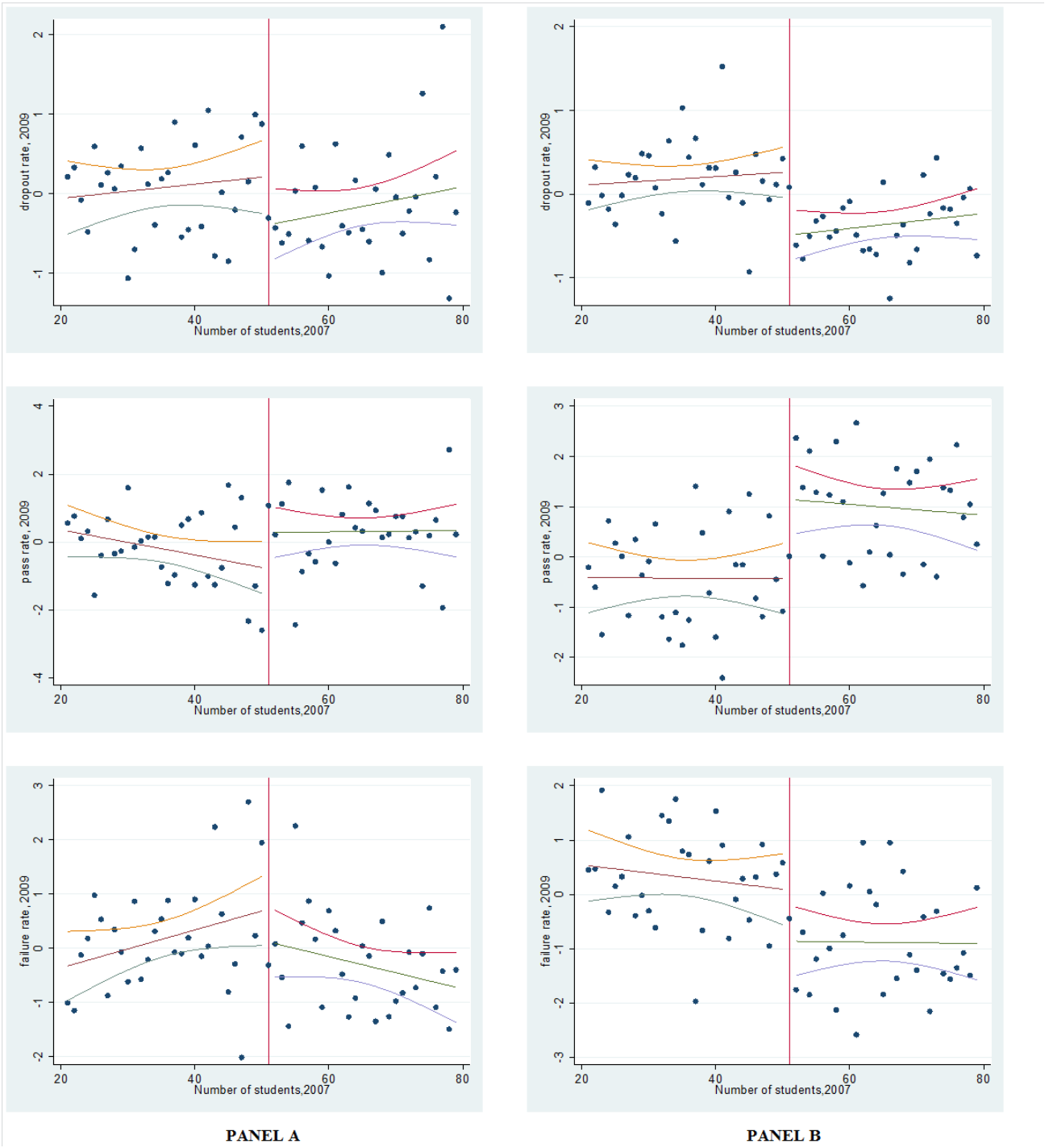


**Figure 3.6: Comparing outcomes by municipality education**

Notes: The figure depicts the relationship of several outcomes in 2009 (controlled by their 2007 past values) and the number of students at school in 2007. While the first column represent schools in municipalities with lower rate of literacy among adults, the second column considers schools in municipalities more educated. The vertical line represents the 51 cutoff.

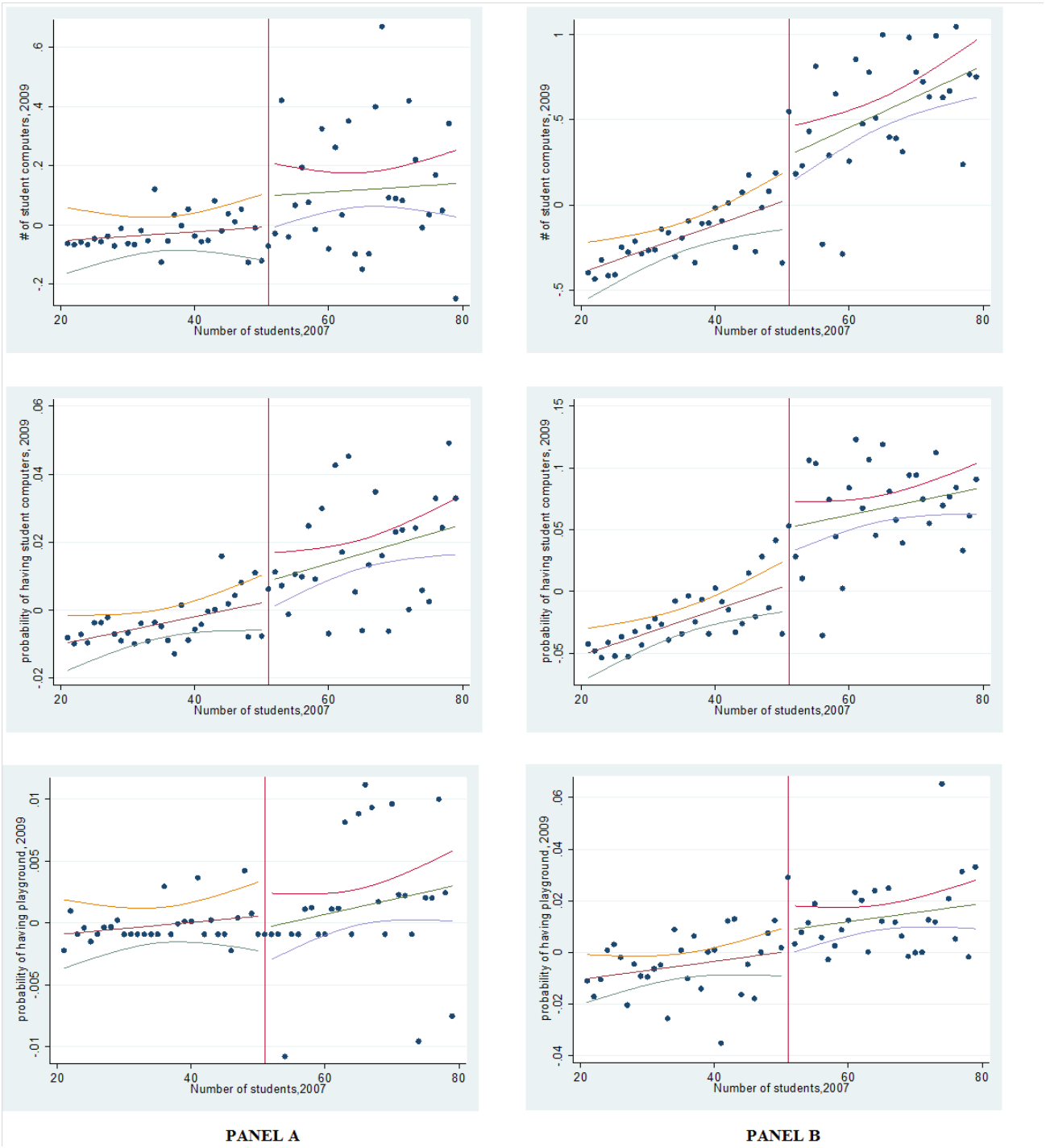


**Figure 3.6: Comparing outcomes by municipality education (Continued)**

Notes: The figure depicts the relationship of several outcomes in 2009 (controlled by their 2007 past values) and the number of students at school in 2007. While the first column represent schools in municipalities with lower rate of literacy among adults, the second column considers schools in municipalities more educated. The vertical line represents the 51 cutoff.

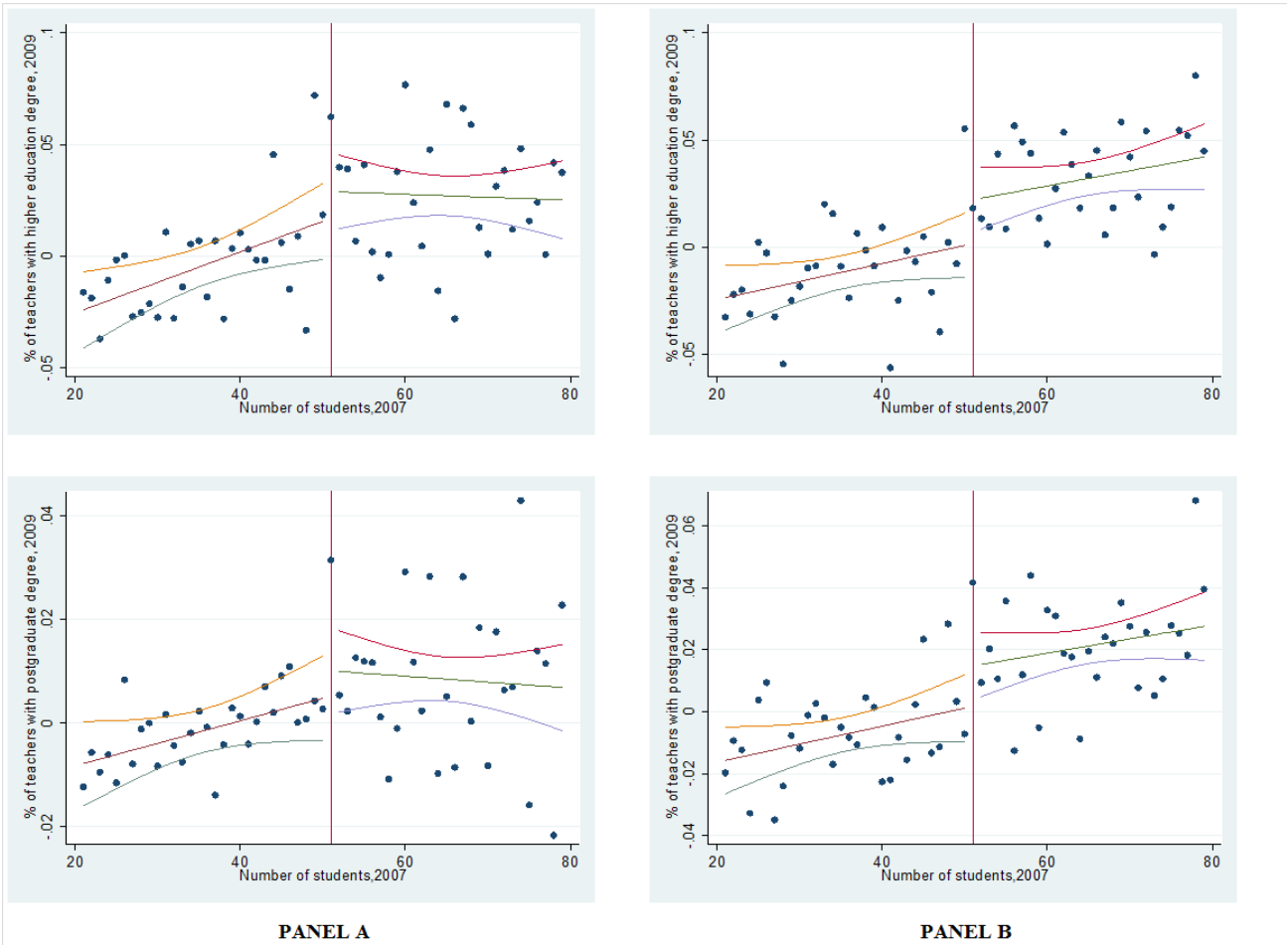


**Figure 3.6: Comparing outcomes by municipality education (Continued)**

Notes: The figure depicts the relationship of several outcomes in 2009 (controlled by their 2007 past values) and the number of students at school in 2007. While the first column represent schools in municipalities with lower rate of literacy among adults, the second column considers schools in municipalities more educated. The vertical line represents the 51 cutoff.

**Table 3.1: Descriptive Statistics, 2007**

| | N | mean | s.d. | min | max |
|---|---|---|---|---|---|
| Panel A: General school characteristics | | | | | |
| autonomous funding (PDDE) | 32758 | 1208.677 | 569.512 | 108 | 12344 |
| school committee | 32758 | 0.505 | 0.499 | 0 | 1 |
| state-run school | 32758 | 0.071 | 0.257 | 0 | 1 |
| urban | 32758 | 0.073 | 0.260 | 0 | 1 |
| North region | 32758 | 0.188 | 0.391 | 0 | 1 |
| Northeast region | 32758 | 0.595 | 0.491 | 0 | 1 |
| Southeast region | 32758 | 0.118 | 0.323 | 0 | 1 |
| South region | 32758 | 0.082 | 0.275 | 0 | 1 |
| Central region | 32758 | 0.016 | 0.126 | 0 | 1 |
| teacher/student ratio | 32716 | 0.062 | 0.036 | 0.013 | 0.654 |
| % of teachers with higher education degree | 32716 | 0.286 | 0.386 | 0 | 1 |
| % of teachers with postgraduate degree | 32716 | 0.060 | 0.187 | 0 | 1 |
| % of female teachers | 32716 | 0.805 | 0.330 | 0 | 1 |
| % of female students | 32758 | 0.454 | 0.091 | 0 | 0.905 |
| Panel B: School academic indices | | | | | |
| pass rate, primary | 32545 | 76.045 | 18.425 | 0 | 100 |
| failure rate, primary | 32545 | 17.486 | 14.820 | 0 | 100 |
| dropout rate, primary | 32545 | 6.469 | 9.686 | 0 | 100 |
| Panel C: School physical infrastructure | | | | | |
| school building | 32758 | 0.896 | 0.305 | 0 | 1 |
| principal office | 32758 | 0.187 | 0.390 | 0 | 1 |
| teacher office | 32758 | 0.118 | 0.322 | 0 | 1 |
| computer lab | 32758 | 0.024 | 0.153 | 0 | 1 |
| science lab | 32758 | 0.005 | 0.072 | 0 | 1 |
| sport court | 32758 | 0.052 | 0.221 | 0 | 1 |
| kitchen | 32758 | 0.821 | 0.383 | 0 | 1 |
| library | 32758 | 0.072 | 0.259 | 0 | 1 |
| playground | 32758 | 0.041 | 0.199 | 0 | 1 |
| classrooms | 32758 | 2.253 | 1.782 | 1 | 59 |
| Panel D: School equipment infrastructure | | | | | |
| TV | 32758 | 0.245 | 0.430 | 0 | 1 |
| VHS | 32758 | 0.162 | 0.368 | 0 | 1 |
| DVD player | 32758 | 0.157 | 0.364 | 0 | 1 |
| Parabolic antenna | 32758 | 0.073 | 0.260 | 0 | 1 |
| Copy machine | 32758 | 0.035 | 0.183 | 0 | 1 |
| Slide projector | 32758 | 0.042 | 0.201 | 0 | 1 |
| Printing machine | 32758 | 0.087 | 0.282 | 0 | 1 |
| # of computers | 32758 | 0.388 | 2.084 | 0 | 72 |
| Having student computers | 32758 | 0.036 | 0.186 | 0 | 1 |
| Having computers | 32758 | 0.105 | 0.307 | 0 | 1 |
| Having internet | 32758 | 0.025 | 0.155 | 0 | 1 |
| # of adm comp | 31996 | 0.124 | 0.525 | 0 | 14 |
| # of student comp | 32075 | 0.221 | 1.558 | 0 | 56 |

Notes: This table reports descriptive statistics on several school characteristics in 2007. The school sample considered include schools with 20-80 students in 2007 that received transfers from PDDE.

**Table 3.2: First-stage results, 2008**

| Dependent variable | (PDDE 2008)/$10^4$ | | | | | | Probability of having school committee/2008 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **1{z>0}** | | | | | | | | | | | | |
| Coef. | 0.079 | 0.079 | 0.079 | 0.080 | 0.079 | 0.079 | 0.371 | 0.325 | 0.323 | 0.355 | 0.343 | 0.336 |
| sd | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.000)*** | (0.010)*** | (0.015)*** | (0.020)*** | (0.011)*** | (0.012)*** | (0.014)*** |
| obs | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 | 30976 | 30976 | 30976 | 24308 | 18228 | 13144 |
| R-squared | 0.969 | 0.969 | 0.969 | 0.968 | 0.968 | 0.967 | 0.367 | 0.367 | 0.367 | 0.354 | 0.328 | 0.300 |
| F-test | 164996 | 74858 | 41858 | 129867 | 101771 | 73201 | 1295.489 | 450.595 | 251.742 | 1024.213 | 765.316 | 571.725 |
| Polynomial form: | | | | | | | | | | | | |
| Linear | X | | | X | X | X | X | | | X | X | X |
| Quadratic | | X | | | | | | X | | | | |
| Cubic | | | X | | | | | | X | | | |
| Sample: | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |

Note: OLS estimates of the effect of having at least 51 students in 2007 on 2008´s autonomous budget(divided by $10^4$) and on the presence of having school committee (measured as 0/1). The variable 1{z>0} indicates that the school has 51 students or more. Regressions include as controls: regional dummies, urban dummy and dummy for state-run school. The school sample considered include schools with 20-80 students in 2007 that received PDDE transfers in 2008. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.3: Placebo effect on general characteristics, 2007**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **state-run school** | | | | | | |
| coef | 0.004 | -0.093 | -0.085 | -0.050 | 0.007 | -0.071 |
| sd | (0.145) | (0.230) | (0.302) | (0.159) | (0.188) | (0.224) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **urban** | | | | | | |
| coef | 0.056 | 0.006 | 0.266 | 0.003 | -0.082 | 0.136 |
| sd | (0.179) | (0.269) | (0.330) | (0.196) | (0.218) | (0.247) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **North region** | | | | | | |
| coef | -0.054 | -0.047 | -0.049 | -0.055 | -0.040 | -0.028 |
| sd | (0.028)* | (0.048) | (0.061) | (0.031)* | (0.037) | (0.046) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **Northeast region** | | | | | | |
| coef | -0.052 | -0.045 | -0.051 | -0.051 | -0.038 | -0.025 |
| sd | (0.028)* | (0.049) | (0.062) | (0.032) | (0.038) | (0.047) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **Southeast region** | | | | | | |
| coef | -0.055 | -0.048 | -0.052 | -0.055 | -0.042 | -0.030 |
| sd | (0.028)* | (0.049) | (0.061) | (0.032)* | (0.037) | (0.046) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **South region** | | | | | | |
| coef | -0.047 | -0.046 | -0.050 | -0.047 | -0.036 | -0.025 |
| sd | (0.027)* | (0.047) | (0.058) | (0.030) | (0.036) | (0.044) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **Central region** | | | | | | |
| coef | -0.049 | -0.041 | -0.041 | -0.051 | -0.033 | -0.020 |
| sd | (0.026)* | (0.045) | (0.057) | (0.029)* | (0.034) | (0.041) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **teacher/student ratio** | | | | | | |
| coef | 0.090 | 0.046 | 0.065 | 0.077 | 0.075 | 0.069 |
| sd | (0.015)*** | (0.020)** | (0.021)*** | (0.015)*** | (0.017)*** | (0.018)*** |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **% of teachers with higher education degree** | | | | | | |
| coef | 0.023 | -0.156 | -0.117 | 0.002 | 0.007 | -0.089 |
| sd | (0.175) | (0.224) | (0.248) | (0.184) | (0.205) | (0.211) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **% of teachers with postgraduate degree** | | | | | | |
| coef | 0.115 | 0.051 | 0.092 | 0.074 | 0.159 | 0.048 |
| sd | (0.085) | (0.116) | (0.132) | (0.087) | (0.101) | (0.111) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **% of female teachers** | | | | | | |
| coef | 0.094 | 0.022 | 0.167 | 0.074 | -0.047 | 0.105 |
| sd | (0.149) | (0.257) | (0.365) | (0.168) | (0.202) | (0.238) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **% of female students** | | | | | | |
| coef | -0.036 | -0.047 | -0.158 | -0.031 | -0.039 | -0.073 |
| sd | (0.036) | (0.046) | (0.039)*** | (0.036) | (0.039) | (0.039)* |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |
| **% of literate adults in municipality (2010)** | | | | | | |
| coef | 0.039 | 0.039 | 0.151 | 0.012 | 0.032 | 0.101 |
| sd | (0.053) | (0.082) | (0.111) | (0.059) | (0.065) | (0.079) |
| obs | 32758 | 32758 | 32758 | 25678 | 19254 | 13900 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on school characteristics in 2007 and municipality literate rate in 2010. Regressions include as controls: regional dummies, urban dummy and dummy for state-run school. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.4: Placebo effect on student performance, 2007**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **pass rate, primary** | | | | | | |
| coef | -1.287 | -12.084 | 4.455 | -6.005 | -7.170 | 1.223 |
| sd | (6.533) | (10.061) | (14.461) | (7.362) | (7.796) | (9.208) |
| obs | 32503 | 32503 | 32503 | 25469 | 19101 | 13781 |
| **failure rate, primary** | | | | | | |
| coef | -1.310 | 5.143 | -2.138 | 1.436 | 1.165 | -1.718 |
| sd | (5.552) | (8.527) | (11.531) | (6.043) | (6.698) | (8.302) |
| obs | 32503 | 32503 | 32503 | 25469 | 19101 | 13781 |
| **dropout rate, primary** | | | | | | |
| coef | 2.597 | 6.941 | -2.317 | 4.569 | 6.005 | 0.495 |
| sd | (4.161) | (6.196) | (7.707) | (4.508) | (4.897) | (5.446) |
| obs | 32503 | 32503 | 32503 | 25469 | 19101 | 13781 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2007 student performance. Regressions include as controls: regional dummies, urban dummy and dummy for state-run schools. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.5: Placebo effect on aggregate indices, 2007**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Physical Infrastructure Index** | | | | | | |
| coef | 0.208 | 0.555 | 0.454 | 0.305 | 0.237 | 0.694 |
| sd | (0.224) | (0.340) | (0.442) | (0.245) | (0.276) | (0.329)** |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Equipment Index** | | | | | | |
| coef | -0.026 | -0.130 | -0.559 | -0.072 | -0.134 | 0.031 |
| sd | (0.242) | (0.396) | (0.564) | (0.281) | (0.308) | (0.405) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on 2007´s infrastructure aggregate indices. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy and dummy for state-run school. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.6: Placebo effect on physical infrastructure items, 2007**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **school building** | | | | | | |
| coef | -0.215 | 0.036 | 0.368 | -0.144 | -0.047 | 0.105 |
| sd | (0.139) | (0.192) | (0.248) | (0.147) | (0.156) | (0.161) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **principal office** | | | | | | |
| coef | 0.384 | 0.351 | 0.218 | 0.370 | 0.321 | 0.198 |
| sd | (0.182)** | (0.299) | (0.385) | (0.212)* | (0.257) | (0.287) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **teacher office** | | | | | | |
| coef | 0.258 | 0.398 | 0.424 | 0.306 | 0.246 | 0.568 |
| sd | (0.169) | (0.276) | (0.371) | (0.190) | (0.214) | (0.261)** |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **computer lab** | | | | | | |
| coef | 0.028 | 0.133 | 0.160 | 0.060 | 0.049 | 0.170 |
| sd | (0.073) | (0.090) | (0.109) | (0.073) | (0.078) | (0.085)** |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **science lab** | | | | | | |
| coef | 0.003 | 0.044 | 0.055 | 0.005 | 0.005 | 0.064 |
| sd | (0.032) | (0.044) | (0.061) | (0.032) | (0.035) | (0.038)* |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **sport court** | | | | | | |
| coef | 0.031 | 0.252 | 0.321 | 0.071 | 0.118 | 0.240 |
| sd | (0.112) | (0.148)* | (0.165)* | (0.116) | (0.127) | (0.138)* |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **kitchen** | | | | | | |
| coef | -0.127 | -0.086 | -0.012 | -0.122 | -0.153 | -0.154 |
| sd | (0.130) | (0.184) | (0.204) | (0.138) | (0.156) | (0.172) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **library** | | | | | | |
| coef | 0.118 | 0.159 | 0.249 | 0.108 | 0.098 | 0.388 |
| sd | (0.148) | (0.231) | (0.312) | (0.156) | (0.181) | (0.237) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **playground** | | | | | | |
| coef | -0.120 | -0.138 | -0.482 | -0.067 | -0.118 | -0.177 |
| sd | (0.140) | (0.211) | (0.217)** | (0.152) | (0.171) | (0.192) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **classrooms** | | | | | | |
| coef | 0.007 | 1.379 | 0.708 | 0.405 | 0.793 | 0.940 |
| sd | (0.751) | (1.249) | (1.641) | (0.808) | (0.950) | (1.103) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on 2007´s physical infrastructure items. Regressions include as controls: regional dummies, urban dummy and dummy for state-run school. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.7: Placebo effect on equipment infrastructure items, 2007**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **TV** | | | | | | |
| coef | 0.496 | 0.439 | 0.035 | 0.496 | 0.481 | 0.422 |
| sd | (0.166)*** | (0.235)* | (0.327) | (0.175)*** | (0.204)** | (0.231)* |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **VHS** | | | | | | |
| coef | 0.176 | -0.051 | -0.325 | 0.148 | 0.060 | -0.062 |
| sd | (0.150) | (0.273) | (0.396) | (0.173) | (0.213) | (0.261) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **DVD player** | | | | | | |
| coef | 0.334 | 0.019 | -0.286 | 0.275 | 0.201 | -0.014 |
| sd | (0.158)** | (0.202) | (0.228) | (0.170) | (0.182) | (0.189) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Parabolic antenna** | | | | | | |
| coef | 0.108 | -0.041 | 0.073 | 0.030 | 0.078 | 0.047 |
| sd | (0.121) | (0.173) | (0.229) | (0.124) | (0.146) | (0.157) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Copy machine** | | | | | | |
| coef | -0.236 | -0.393 | -0.519 | -0.261 | -0.354 | -0.268 |
| sd | (0.099)** | (0.124)*** | (0.162)*** | (0.107)** | (0.112)*** | (0.142)* |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Slide projector** | | | | | | |
| coef | 0.010 | 0.053 | 0.064 | -0.005 | 0.015 | 0.114 |
| sd | (0.089) | (0.135) | (0.203) | (0.099) | (0.113) | (0.133) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Printing machine** | | | | | | |
| coef | 0.002 | 0.258 | 0.130 | 0.070 | 0.106 | 0.299 |
| sd | (0.107) | (0.166) | (0.240) | (0.113) | (0.125) | (0.165)* |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **# of computers** | | | | | | |
| coef | -1.202 | -1.810 | -3.988 | -1.163 | -1.994 | -1.850 |
| sd | (1.008) | (1.570) | (2.028)** | (1.113) | (1.250) | (1.469) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Having student computers** | | | | | | |
| coef | -0.156 | -0.146 | -0.227 | -0.165 | -0.191 | -0.151 |
| sd | (0.087)* | (0.143) | (0.198) | (0.097)* | (0.111)* | (0.132) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **Having computers** | | | | | | |
| coef | -0.099 | -0.012 | -0.304 | -0.026 | -0.073 | -0.021 |
| sd | (0.122) | (0.222) | (0.314) | (0.138) | (0.165) | (0.212) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **internet** | | | | | | |
| coef | -0.050 | -0.046 | -0.052 | -0.078 | -0.066 | -0.019 |
| sd | (0.067) | (0.098) | (0.135) | (0.070) | (0.071) | (0.092) |
| obs | 32716 | 32716 | 32716 | 25648 | 19235 | 13887 |
| **# of adm comp** | | | | | | |
| coef | -0.166 | 0.100 | -0.058 | -0.098 | -0.112 | -0.052 |
| sd | (0.220) | (0.284) | (0.276) | (0.230) | (0.252) | (0.281) |
| obs | 31954 | 31954 | 31954 | 24998 | 18725 | 13519 |
| **# of student comp** | | | | | | |
| coef | -1.102 | -1.228 | -1.898 | -1.162 | -1.573 | -1.208 |
| sd | (0.802) | (1.146) | (1.362) | (0.860) | (0.963) | (1.052) |
| obs | 32033 | 32033 | 32033 | 25058 | 18766 | 13538 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on 2007´s equipment items. Regressions include as controls: regional dummies, urban dummy and state-run dummy. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.8: Effect on student performance, 2008**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **pass rate, primary** | | | | | | | |
| coef | 0.189 | 10.736 | -4.663 | -4.762 | 6.168 | 2.305 | -1.465 |
| sd | (1.963) | (4.425)** | (6.339) | (7.333) | (4.355) | (4.901) | (5.682) |
| obs | 30344 | 30344 | 30344 | 30344 | 23806 | 17852 | 12860 |
| **failure rate, primary** | | | | | | | |
| coef | -0.392 | -7.867 | 4.498 | 6.765 | -4.706 | -0.485 | 2.167 |
| sd | (1.638) | (4.230)* | (6.401) | (8.141) | (4.336) | (4.966) | (5.915) |
| obs | 30344 | 30344 | 30344 | 30344 | 23806 | 17852 | 12860 |
| **dropout rate, primary** | | | | | | | |
| coef | 0.136 | -3.548 | 0.274 | -2.838 | -1.872 | -2.139 | -1.541 |
| sd | (1.133) | (2.240) | (2.597) | (2.906) | (2.478) | (2.197) | (2.366) |
| obs | 30344 | 30344 | 30344 | 30344 | 23806 | 17852 | 12860 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s student performance indices. Regressions include as controls: regional dummies, urban dummy and state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.9: Effect on aggregate indices, 2008**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Physical Infrastructure Index** | | | | | | | |
| coef | 0.413 | -0.008 | -0.168 | -0.133 | -0.087 | -0.101 | -0.106 |
| sd | (0.031)*** | (0.071) | (0.081)** | (0.097) | (0.067) | (0.070) | (0.070) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **Equipment Index** | | | | | | | |
| coef | 0.909 | 0.437 | 0.195 | 0.276 | 0.370 | 0.250 | 0.230 |
| sd | (0.047)*** | (0.100)*** | (0.135) | (0.178) | (0.108)*** | (0.119)** | (0.127)* |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on 2008´s infrastructure aggregate indices. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index takes into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.10: Effect on physical infrastructure items, 2008**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **school building** | | | | | | | |
| coef | 0.038 | -0.042 | -0.069 | -0.127 | -0.047 | -0.051 | -0.062 |
| sd | (0.015)** | (0.036) | (0.056) | (0.067)* | (0.039) | (0.046) | (0.055) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **principal office** | | | | | | | |
| coef | 0.486 | 0.022 | -0.109 | -0.145 | -0.033 | -0.012 | -0.029 |
| sd | (0.044)*** | (0.071) | (0.098) | (0.136) | (0.076) | (0.086) | (0.098) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **teacher office** | | | | | | | |
| coef | 0.186 | -0.051 | -0.033 | -0.025 | -0.051 | -0.030 | -0.029 |
| sd | (0.025)*** | (0.047) | (0.061) | (0.074) | (0.049) | (0.053) | (0.057) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **computer lab** | | | | | | | |
| coef | 0.135 | 0.042 | 0.029 | -0.004 | 0.015 | 0.040 | 0.022 |
| sd | (0.017)*** | (0.053) | (0.062) | (0.071) | (0.056) | (0.053) | (0.057) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **science lab** | | | | | | | |
| coef | 0.012 | -0.004 | 0.009 | 0.029 | -0.001 | -0.004 | 0.013 |
| sd | (0.006)* | (0.013) | (0.017) | (0.018) | (0.014) | (0.015) | (0.014) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **sport court** | | | | | | | |
| coef | 0.072 | 0.015 | -0.095 | -0.078 | -0.003 | -0.071 | -0.077 |
| sd | (0.018)*** | (0.036) | (0.039)** | (0.049) | (0.038) | (0.037)* | (0.034)** |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **kitchen** | | | | | | | |
| coef | 0.147 | 0.069 | -0.070 | -0.100 | 0.014 | -0.005 | -0.031 |
| sd | (0.022)*** | (0.060) | (0.086) | (0.095) | (0.065) | (0.073) | (0.081) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **library** | | | | | | | |
| coef | 0.151 | -0.010 | -0.017 | 0.052 | -0.031 | -0.010 | -0.006 |
| sd | (0.020)*** | (0.041) | (0.055) | (0.059) | (0.043) | (0.045) | (0.052) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **playground** | | | | | | | |
| coef | 0.027 | -0.013 | -0.068 | -0.057 | -0.036 | -0.057 | -0.056 |
| sd | (0.012)** | (0.031) | (0.039)* | (0.048) | (0.031) | (0.034)* | (0.036) |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **classrooms** | | | | | | | |
| coef | 1.439 | 0.072 | -0.076 | -0.125 | 0.035 | -0.021 | 0.118 |
| sd | (0.309)*** | (0.256) | (0.329) | (0.384) | (0.245) | (0.259) | (0.258) |
| obs | 30956 | 30956 | 30956 | 30956 | 24293 | 18217 | 13135 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s physical infrastructure items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.11: Effect on equipment infrastructure items, 2008**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **TV** | | | | | | | |
| coef | 0.794 | 0.297 | 0.006 | -0.040 | 0.221 | 0.128 | 0.050 |
| sd | (0.046)*** | (0.073)*** | (0.081) | (0.093) | (0.074)*** | (0.075)* | (0.073) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **VHS** | | | | | | | |
| coef | 0.143 | 0.015 | 0.025 | 0.057 | 0.016 | 0.021 | -0.015 |
| sd | (0.029)*** | (0.055) | (0.070) | (0.092) | (0.059) | (0.055) | (0.071) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **DVD player** | | | | | | | |
| coef | 1.108 | 0.495 | 0.201 | 0.100 | 0.434 | 0.309 | 0.204 |
| sd | (0.054)*** | (0.087)*** | (0.113)* | (0.121) | (0.093)*** | (0.098)*** | (0.098)** |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **Parabolic antenna** | | | | | | | |
| coef | 0.231 | 0.054 | 0.091 | 0.062 | 0.066 | 0.054 | 0.102 |
| sd | (0.027)*** | (0.066) | (0.103) | (0.140) | (0.070) | (0.079) | (0.095) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **Copy machine** | | | | | | | |
| coef | 0.164 | 0.103 | 0.063 | 0.066 | 0.104 | 0.065 | 0.077 |
| sd | (0.022)*** | (0.054)* | (0.075) | (0.090) | (0.057)* | (0.060) | (0.071) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **Slide projector** | | | | | | | |
| coef | 0.090 | 0.047 | -0.005 | 0.000 | 0.040 | 0.018 | -0.019 |
| sd | (0.014)*** | (0.029) | (0.038) | (0.040) | (0.032) | (0.034) | (0.037) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **Printing machine** | | | | | | | |
| coef | 0.347 | 0.109 | 0.048 | 0.157 | 0.082 | 0.042 | 0.074 |
| sd | (0.031)*** | (0.053)** | (0.073) | (0.084)* | (0.059) | (0.065) | (0.071) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **# of computers** | | | | | | | |
| coef | 1.646 | 0.632 | 1.285 | 2.487 | 0.478 | 1.075 | 1.336 |
| sd | (0.202)*** | (0.480) | (0.577)** | (0.672)*** | (0.508) | (0.526)** | (0.517)*** |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **Having student computers** | | | | | | | |
| coef | 0.207 | 0.209 | 0.147 | 0.196 | 0.176 | 0.167 | 0.176 |
| sd | (0.020)*** | (0.055)*** | (0.067)** | (0.071)*** | (0.058)*** | (0.065)** | (0.066)*** |
| obs | 30982 | 30982 | 30982 | 30982 | 24312 | 18232 | 13147 |
| **Having computers** | | | | | | | |
| coef | 0.364 | 0.122 | 0.136 | 0.265 | 0.106 | 0.110 | 0.166 |
| sd | (0.037)*** | (0.071)* | (0.098) | (0.095)*** | (0.077) | (0.091) | (0.094)* |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **internet** | | | | | | | |
| coef | 0.133 | 0.023 | -0.027 | -0.006 | 0.002 | -0.021 | -0.024 |
| sd | (0.022)*** | (0.061) | (0.084) | (0.118) | (0.065) | (0.074) | (0.082) |
| obs | 30969 | 30969 | 30969 | 30969 | 24301 | 18222 | 13140 |
| **# of adm comp** | | | | | | | |
| coef | 0.526 | 0.216 | 0.149 | 0.459 | 0.134 | 0.161 | 0.164 |
| sd | (0.071)*** | (0.149) | (0.219) | (0.199)** | (0.156) | (0.188) | (0.214) |
| obs | 30031 | 30031 | 30031 | 30031 | 23512 | 17592 | 12670 |
| **# of student comp** | | | | | | | |
| coef | 1.085 | 0.670 | 1.169 | 1.713 | 0.703 | 0.900 | 1.287 |
| sd | (0.161)*** | (0.432) | (0.532)** | (0.615)*** | (0.434) | (0.478)* | (0.501)** |
| obs | 30140 | 30140 | 30140 | 30140 | 23593 | 17650 | 12703 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s equipment items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.12: First-stage results, 2009**

| Dependent variable | (PDDE 2008-2009)/$10^4$ | | | | | | Probability of having school committee/2008-09 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **1{z>0}** | | | | | | | | | | | | |
| Coef. | 0.101 | 0.087 | 0.079 | 0.098 | 0.095 | 0.089 | 0.298 | 0.203 | 0.190 | 0.268 | 0.246 | 0.224 |
| sd | (0.003)*** | (0.004)*** | (0.005)*** | (0.003)*** | (0.003)*** | (0.004)*** | (0.011)*** | (0.016)*** | (0.022)*** | (0.012)*** | (0.014)*** | (0.016)*** |
| obs | 24868 | 24868 | 24868 | 19466 | 14529 | 10431 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| R-squared | 0.568 | 0.568 | 0.568 | 0.538 | 0.486 | 0.441 | 0.409 | 0.411 | 0.411 | 0.384 | 0.337 | 0.287 |
| F-test | 1632.715 | 545.750 | 248.654 | 1210.709 | 846.152 | 527.923 | 733.355 | 152.938 | 74.671 | 496.306 | 318.766 | 199.287 |
| Polynomial form: | | | | | | | | | | | | |
| Linear | X | | | X | X | X | X | | | X | X | X |
| Quadratic | | X | | | | | | X | | | | |
| Cubic | | | X | | | | | | X | | | |
| Sample: | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |

Note: OLS estimates of the effect of having at least 51 students in 2007 on 2008-2009 autonomous budget (divided by $10^4$) and on the presence of having school committee in the period 2008-09 (measured as 0/1). The variable 1{z>0} indicates that the school has 51 students or more. Regressions include as controls: regional dummies, urban dummy and state-run dummy. The school sample considered include schools with 20-80 students in 2007 that received PDDE transfers in the period 2008-09. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.13: Effect on student performance, 2009**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **pass rate, primary** | | | | | | | |
| coef | 1.271 | 11.162 | 13.655 | 23.404 | 10.990 | 11.338 | 13.533 |
| sd | (0.677)* | (3.447)*** | (6.144)** | (7.415)*** | (3.901)*** | (4.702)** | (6.002)** |
| obs | 24276 | 24276 | 24276 | 24276 | 19014 | 14197 | 10186 |
| **failure rate, primary** | | | | | | | |
| coef | -1.474 | -6.870 | -8.618 | -17.853 | -6.804 | -7.048 | -11.031 |
| sd | (0.631)** | (2.886)** | (4.808)* | (5.897)*** | (3.116)** | (3.677)* | (4.647)** |
| obs | 24276 | 24276 | 24276 | 24276 | 19014 | 14197 | 10186 |
| **dropout rate, primary** | | | | | | | |
| coef | -0.381 | -5.079 | -4.796 | -6.380 | -4.667 | -4.660 | -3.098 |
| sd | (0.280) | (1.715)*** | (2.915)* | (3.673)* | (1.912)** | (2.254)** | (2.957) |
| obs | 24276 | 24276 | 24276 | 24276 | 19014 | 14197 | 10186 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s student performance indices. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.14: Effect on aggregate indices, 2009**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Physical Infrastructure Index** | | | | | | | |
| coef | 0.364 | -0.020 | -0.185 | -0.188 | -0.066 | -0.105 | -0.168 |
| sd | (0.016)*** | (0.082) | (0.127) | (0.154) | (0.089) | (0.097) | (0.123) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **Equipment Index** | | | | | | | |
| coef | 0.583 | 0.670 | 0.451 | 0.551 | 0.598 | 0.538 | 0.550 |
| sd | (0.022)*** | (0.101)*** | (0.175)** | (0.267)** | (0.115)*** | (0.135)*** | (0.161)*** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s infrastructure aggregate indices. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.15: Effect on physical infrastructure items, 2009**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **school building** | | | | | | | |
| coef | 0.058 | -0.021 | -0.083 | -0.064 | -0.029 | -0.046 | -0.053 |
| sd | (0.006)*** | (0.033) | (0.050)* | (0.066) | (0.037) | (0.037) | (0.045) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **principal office** | | | | | | | |
| coef | 0.363 | -0.061 | -0.355 | -0.320 | -0.129 | -0.167 | -0.178 |
| sd | (0.018)*** | (0.090) | (0.121)*** | (0.176)* | (0.095) | (0.099)* | (0.127) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **teacher office** | | | | | | | |
| coef | 0.159 | 0.029 | 0.075 | 0.154 | 0.026 | 0.054 | 0.035 |
| sd | (0.014)*** | (0.076) | (0.108) | (0.151) | (0.084) | (0.090) | (0.108) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **computer lab** | | | | | | | |
| coef | 0.144 | 0.098 | 0.079 | -0.038 | 0.101 | 0.097 | 0.056 |
| sd | (0.011)*** | (0.058)* | (0.070) | (0.086) | (0.065) | (0.056)* | (0.064) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **science lab** | | | | | | | |
| coef | 0.037 | -0.014 | -0.011 | 0.013 | -0.012 | -0.017 | -0.002 |
| sd | (0.006)*** | (0.014) | (0.023) | (0.031) | (0.016) | (0.019) | (0.020) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **sport court** | | | | | | | |
| coef | 0.060 | -0.004 | -0.102 | -0.119 | -0.010 | -0.091 | -0.128 |
| sd | (0.009)*** | (0.034) | (0.057)* | (0.089) | (0.039) | (0.040)** | (0.054)** |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **kitchen** | | | | | | | |
| coef | 0.109 | -0.016 | -0.005 | 0.104 | -0.043 | -0.022 | 0.024 |
| sd | (0.010)*** | (0.048) | (0.090) | (0.118) | (0.057) | (0.067) | (0.084) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **library** | | | | | | | |
| coef | 0.138 | 0.012 | -0.116 | -0.158 | -0.019 | -0.063 | -0.104 |
| sd | (0.011)*** | (0.055) | (0.099) | (0.171) | (0.062) | (0.070) | (0.103) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **playground** | | | | | | | |
| coef | 0.025 | 0.027 | 0.054 | 0.031 | 0.029 | 0.054 | 0.029 |
| sd | (0.006)*** | (0.026) | (0.037) | (0.047) | (0.030) | (0.030)* | (0.035) |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **classrooms** | | | | | | | |
| coef | 1.453 | -0.027 | -0.647 | -1.133 | -0.102 | -0.317 | -0.430 |
| sd | (0.163)*** | (0.247) | (0.372)* | (0.542)** | (0.261) | (0.294) | (0.360) |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s physical infrastructure items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.16: Effect on equipment infrastructure items, 2009**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **TV** | | | | | | | |
| coef | 0.555 | 0.703 | 0.542 | 0.412 | 0.646 | 0.639 | 0.572 |
| sd | (0.023)*** | (0.084)*** | (0.155)*** | (0.229)* | (0.091)*** | (0.119)*** | (0.146)*** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **VHS** | | | | | | | |
| coef | 0.104 | -0.001 | -0.009 | -0.111 | 0.008 | 0.001 | -0.078 |
| sd | (0.011)*** | (0.046) | (0.063) | (0.074) | (0.053) | (0.053) | (0.060) |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **DVD player** | | | | | | | |
| coef | 0.676 | 0.803 | 0.614 | 0.349 | 0.758 | 0.723 | 0.657 |
| sd | (0.026)*** | (0.094)*** | (0.174)*** | (0.254) | (0.107)*** | (0.132)*** | (0.162)*** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **Parabolic antenna** | | | | | | | |
| coef | 0.119 | 0.097 | 0.211 | 0.182 | 0.128 | 0.157 | 0.188 |
| sd | (0.012)*** | (0.060) | (0.089)** | (0.113) | (0.067)* | (0.072)** | (0.091)** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **Copy machine** | | | | | | | |
| coef | 0.151 | 0.192 | 0.144 | 0.201 | 0.171 | 0.159 | 0.226 |
| sd | (0.015)*** | (0.049)*** | (0.064)** | (0.083)** | (0.056)*** | (0.055)*** | (0.063)*** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **Slide projector** | | | | | | | |
| coef | 0.068 | 0.003 | -0.107 | -0.076 | -0.028 | -0.078 | -0.095 |
| sd | (0.006)*** | (0.035) | (0.065)* | (0.069) | (0.038) | (0.046)* | (0.057)* |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **Printing machine** | | | | | | | |
| coef | 0.261 | 0.281 | 0.107 | 0.215 | 0.230 | 0.185 | 0.197 |
| sd | (0.015)*** | (0.064)*** | (0.102) | (0.134) | (0.066)*** | (0.077)** | (0.094)** |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **# of computers** | | | | | | | |
| coef | 3.359 | 1.585 | 2.310 | 4.612 | 1.525 | 1.827 | 2.398 |
| sd | (0.388)*** | (0.806)** | (1.353)* | (1.904)** | (0.877)* | (1.021)* | (1.268)* |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **Having student computers** | | | | | | | |
| coef | 0.170 | 0.268 | 0.257 | 0.309 | 0.270 | 0.268 | 0.266 |
| sd | (0.013)*** | (0.091)*** | (0.145)* | (0.184)* | (0.102)*** | (0.116)** | (0.139)* |
| obs | 24862 | 24862 | 24862 | 24862 | 19462 | 14525 | 10428 |
| **Having computers** | | | | | | | |
| coef | 0.272 | 0.154 | 0.094 | 0.217 | 0.130 | 0.092 | 0.143 |
| sd | (0.018)*** | (0.063)** | (0.093) | (0.106)** | (0.069)* | (0.080) | (0.089) |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **internet** | | | | | | | |
| coef | 0.117 | -0.017 | -0.076 | 0.013 | -0.047 | -0.053 | -0.050 |
| sd | (0.012)*** | (0.080) | (0.126) | (0.170) | (0.086) | (0.097) | (0.115) |
| obs | 24845 | 24845 | 24845 | 24845 | 19455 | 14520 | 10423 |
| **# of adm comp** | | | | | | | |
| coef | 0.513 | 0.208 | -0.129 | 0.052 | 0.097 | -0.015 | 0.001 |
| sd | (0.048)*** | (0.158) | (0.273) | (0.400) | (0.170) | (0.202) | (0.239) |
| obs | 23951 | 23951 | 23951 | 23951 | 18689 | 13908 | 9967 |
| **# of student comp** | | | | | | | |
| coef | 2.268 | 1.594 | 1.782 | 3.019 | 1.645 | 1.421 | 2.057 |
| sd | (0.299)*** | (0.649)** | (0.908)** | (1.141)*** | (0.676)** | (0.764)* | (0.880)** |
| obs | 24103 | 24103 | 24103 | 24103 | 18808 | 14001 | 10029 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget(divided by $10^4$) on 2009´s equipment items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.17: Effect on student performance by municipality education, 2009**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **pass rate, primary** | | | | | | | | | | | | |
| coef | 6.030 | 7.078 | 21.737 | 6.106 | 4.704 | 4.801 | 15.260 | 18.428 | 19.984 | 15.040 | 16.189 | 20.575 |
| sd | (4.977) | (8.817) | (11.474)* | (5.540) | (6.784) | (9.018) | (5.005)*** | (8.898)** | (12.805) | (5.669)*** | (6.766)** | (8.088)** |
| obs | 12213 | 12213 | 12213 | 9553 | 7025 | 5024 | 12063 | 12063 | 12063 | 9461 | 7172 | 5162 |
| **failure rate, primary** | | | | | | | | | | | | |
| coef | -3.712 | -0.837 | -13.777 | -2.889 | -1.232 | -2.222 | -8.676 | -15.224 | -17.700 | -9.775 | -11.108 | -18.361 |
| sd | (4.472) | (8.360) | (11.312) | (5.093) | (6.509) | (8.196) | (4.116)** | (6.644)** | (9.595)* | (4.280)** | (5.082)** | (6.249)*** |
| obs | 12213 | 12213 | 12213 | 9553 | 7025 | 5024 | 12063 | 12063 | 12063 | 9461 | 7172 | 5162 |
| **dropout rate, primary** | | | | | | | | | | | | |
| coef | -3.307 | -6.330 | -9.130 | -4.079 | -4.064 | -3.697 | -6.982 | -2.512 | -2.364 | -5.251 | -4.867 | -1.910 |
| sd | (2.362) | (3.429)* | (4.507)** | (2.528) | (2.933) | (3.746) | (2.116)*** | (3.570) | (4.464) | (2.302)** | (2.677)* | (3.138) |
| obs | 12213 | 12213 | 12213 | 9553 | 7025 | 5024 | 12063 | 12063 | 12063 | 9461 | 7172 | 5162 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget(divided by $10^4$) on 2009´s student performance indices. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.18: Effect on aggregate indices by municipality education, 2009**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Physical Infrastructure Index** | | | | | | | | | | | | |
| coef | -0.071 | -0.260 | -0.401 | -0.086 | -0.162 | -0.287 | 0.003 | -0.155 | -0.033 | -0.083 | -0.085 | -0.088 |
| sd | (0.090) | (0.129)** | (0.181)** | (0.096) | (0.106) | (0.122)** | (0.171) | (0.273) | (0.292) | (0.196) | (0.210) | (0.263) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **Equipment Index** | | | | | | | | | | | | |
| coef | 0.452 | 0.467 | 0.337 | 0.477 | 0.414 | 0.435 | 0.704 | 0.240 | 0.640 | 0.521 | 0.490 | 0.480 |
| sd | (0.076)*** | (0.137)*** | (0.249) | (0.086)*** | (0.101)*** | (0.135)*** | (0.194)*** | (0.296) | (0.321)** | (0.221)** | (0.239)** | (0.263)* |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s infrastructure aggregate indices. The sample is divided considering the median of the proportion of literate adults. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.19: Effect on physical infrastructure items by municipality education, 2009**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **school building** | | | | | | | | | | | | |
| coef | -0.053 | -0.033 | -0.012 | -0.040 | -0.024 | -0.056 | 0.015 | -0.135 | -0.103 | -0.012 | -0.071 | -0.048 |
| sd | (0.048) | (0.066) | (0.104) | (0.051) | (0.053) | (0.066) | (0.038) | (0.061)** | (0.069) | (0.044) | (0.043)* | (0.050) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **principal office** | | | | | | | | | | | | |
| coef | -0.109 | -0.429 | -0.258 | -0.220 | -0.209 | -0.254 | -0.036 | -0.305 | -0.433 | -0.053 | -0.141 | -0.127 |
| sd | (0.120) | (0.165)*** | (0.235) | (0.120)* | (0.140) | (0.158) | (0.114) | (0.200) | (0.297) | (0.132) | (0.138) | (0.207) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **teacher office** | | | | | | | | | | | | |
| coef | -0.058 | -0.047 | 0.067 | -0.040 | -0.072 | -0.088 | 0.084 | 0.138 | 0.170 | 0.055 | 0.131 | 0.098 |
| sd | (0.067) | (0.093) | (0.140) | (0.069) | (0.079) | (0.099) | (0.132) | (0.219) | (0.295) | (0.156) | (0.159) | (0.198) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **computer lab** | | | | | | | | | | | | |
| coef | 0.070 | 0.056 | -0.091 | 0.081 | 0.056 | 0.017 | 0.123 | 0.092 | -0.006 | 0.117 | 0.141 | 0.095 |
| sd | (0.044) | (0.050) | (0.089) | (0.052) | (0.044) | (0.049) | (0.114) | (0.162) | (0.169) | (0.130) | (0.126) | (0.146) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **science lab** | | | | | | | | | | | | |
| coef | -0.026 | -0.021 | -0.038 | -0.016 | -0.026 | -0.029 | 0.001 | 0.002 | 0.067 | -0.007 | -0.008 | 0.027 |
| sd | (0.017) | (0.028) | (0.038) | (0.018) | (0.021) | (0.027) | (0.026) | (0.040) | (0.045) | (0.028) | (0.033) | (0.031) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **sport court** | | | | | | | | | | | | |
| coef | -0.004 | -0.067 | -0.142 | -0.003 | -0.041 | -0.101 | -0.010 | -0.154 | -0.105 | -0.026 | -0.153 | -0.165 |
| sd | (0.038) | (0.055) | (0.089) | (0.041) | (0.043) | (0.053)* | (0.069) | (0.115) | (0.161) | (0.079) | (0.083)* | (0.108) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **kitchen** | | | | | | | | | | | | |
| coef | -0.066 | -0.043 | -0.109 | -0.056 | -0.041 | -0.052 | 0.029 | 0.040 | 0.332 | -0.038 | -0.008 | 0.100 |
| sd | (0.081) | (0.136) | (0.201) | (0.088) | (0.107) | (0.133) | (0.098) | (0.189) | (0.215) | (0.118) | (0.136) | (0.166) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **library** | | | | | | | | | | | | |
| coef | 0.063 | -0.079 | -0.215 | 0.034 | -0.013 | -0.108 | -0.044 | -0.179 | -0.117 | -0.087 | -0.124 | -0.108 |
| sd | (0.072) | (0.120) | (0.201) | (0.076) | (0.093) | (0.116) | (0.086) | (0.140) | (0.198) | (0.098) | (0.105) | (0.149) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **playground** | | | | | | | | | | | | |
| coef | -0.016 | -0.060 | -0.050 | -0.021 | -0.043 | -0.052 | 0.067 | 0.173 | 0.093 | 0.079 | 0.152 | 0.107 |
| sd | (0.015) | (0.024)** | (0.032) | (0.015) | (0.019)** | (0.023)** | (0.060) | (0.077)** | (0.093) | (0.070) | (0.062)** | (0.071) |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **classrooms** | | | | | | | | | | | | |
| coef | 0.151 | -0.086 | -1.266 | 0.296 | 0.016 | -0.075 | -0.029 | -1.083 | -0.930 | -0.324 | -0.570 | -0.738 |
| sd | (0.286) | (0.461) | (0.687)* | (0.307) | (0.344) | (0.384) | (0.401) | (0.512)** | (0.659) | (0.417) | (0.443) | (0.503) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget(divided by 104) on 2009´s physical infrastructure items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.20: Effect on equipment infrastructure items by municipality education, 2009**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **TV** | | | | | | | | | | | | |
| coef | 0.804 | 0.666 | 0.360 | 0.788 | 0.721 | 0.639 | 0.538 | 0.375 | 0.414 | 0.446 | 0.501 | 0.439 |
| sd | (0.123)*** | (0.201)*** | (0.279) | (0.126)*** | (0.158)*** | (0.188)*** | (0.121)*** | (0.209)* | (0.290) | (0.138)*** | (0.158)*** | (0.186)** |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **VHS** | | | | | | | | | | | | |
| coef | -0.039 | -0.032 | -0.260 | 0.002 | -0.041 | -0.113 | 0.032 | 0.002 | 0.027 | -0.003 | 0.033 | -0.050 |
| sd | (0.068) | (0.120) | (0.174) | (0.071) | (0.084) | (0.104) | (0.101) | (0.172) | (0.241) | (0.116) | (0.119) | (0.150) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **DVD player** | | | | | | | | | | | | |
| coef | 0.915 | 0.673 | 0.324 | 0.850 | 0.823 | 0.734 | 0.628 | 0.540 | 0.379 | 0.615 | 0.593 | 0.537 |
| sd | (0.130)*** | (0.234)*** | (0.350) | (0.141)*** | (0.177)*** | (0.232)*** | (0.112)*** | (0.181)*** | (0.221)* | (0.130)*** | (0.147)*** | (0.155)*** |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **Parabolic antenna** | | | | | | | | | | | | |
| coef | 0.083 | 0.236 | 0.206 | 0.124 | 0.163 | 0.202 | 0.109 | 0.187 | 0.146 | 0.130 | 0.151 | 0.174 |
| sd | (0.061) | (0.094)** | (0.145) | (0.066)* | (0.073)** | (0.090)** | (0.111) | (0.207) | (0.300) | (0.131) | (0.147) | (0.192) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **Copy machine** | | | | | | | | | | | | |
| coef | 0.107 | 0.066 | 0.023 | 0.099 | 0.093 | 0.104 | 0.272 | 0.190 | 0.306 | 0.234 | 0.208 | 0.322 |
| sd | (0.054)** | (0.078) | (0.139) | (0.058)* | (0.064) | (0.079) | (0.094)*** | (0.155) | (0.198) | (0.109)** | (0.119)* | (0.143)** |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **Slide projector** | | | | | | | | | | | | |
| coef | -0.040 | -0.064 | -0.017 | -0.050 | -0.070 | -0.076 | 0.049 | -0.164 | -0.151 | -0.010 | -0.087 | -0.127 |
| sd | (0.025) | (0.045) | (0.057) | (0.028)* | (0.037)* | (0.044)* | (0.059) | (0.106) | (0.106) | (0.064) | (0.072) | (0.090) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **Printing machine** | | | | | | | | | | | | |
| coef | 0.187 | 0.143 | 0.208 | 0.184 | 0.118 | 0.150 | 0.373 | 0.030 | 0.176 | 0.263 | 0.242 | 0.215 |
| sd | (0.068)*** | (0.111) | (0.144) | (0.074)** | (0.087) | (0.105) | (0.112)*** | (0.173) | (0.228) | (0.119)** | (0.133)* | (0.156) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **# of computers** | | | | | | | | | | | | |
| coef | 0.680 | 1.228 | 2.058 | 0.817 | 0.859 | 1.521 | 2.892 | 3.889 | 7.674 | 2.575 | 3.381 | 3.914 |
| sd | (0.628) | (0.982) | (1.334) | (0.606) | (0.754) | (0.923)* | (1.564)* | (2.738) | (3.512)** | (1.777) | (2.040)* | (2.522) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **Having student computers** | | | | | | | | | | | | |
| coef | 0.063 | 0.050 | -0.054 | 0.082 | 0.049 | 0.015 | 0.506 | 0.501 | 0.680 | 0.497 | 0.528 | 0.566 |
| sd | (0.039) | (0.059) | (0.101) | (0.043)* | (0.047) | (0.060) | (0.179)*** | (0.280)* | (0.310)** | (0.204)** | (0.221)** | (0.259)** |
| obs | 12435 | 12435 | 12435 | 9713 | 7143 | 5107 | 12427 | 12427 | 12427 | 9749 | 7382 | 5321 |
| **Having computers** | | | | | | | | | | | | |
| coef | 0.167 | 0.216 | 0.200 | 0.195 | 0.123 | 0.220 | 0.112 | -0.081 | 0.202 | 0.019 | 0.039 | 0.032 |
| sd | (0.069)** | (0.097)** | (0.138) | (0.071)*** | (0.083) | (0.096)** | (0.105) | (0.161) | (0.170) | (0.121) | (0.131) | (0.137) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **internet** | | | | | | | | | | | | |
| coef | -0.057 | 0.044 | -0.036 | -0.019 | -0.021 | -0.019 | 0.023 | -0.237 | 0.054 | -0.099 | -0.091 | -0.093 |
| sd | (0.049) | (0.075) | (0.113) | (0.042) | (0.052) | (0.064) | (0.175) | (0.301) | (0.388) | (0.199) | (0.222) | (0.269) |
| obs | 12422 | 12422 | 12422 | 9709 | 7139 | 5103 | 12423 | 12423 | 12423 | 9746 | 7381 | 5320 |
| **# of adm comp** | | | | | | | | | | | | |
| coef | 0.166 | 0.179 | 0.204 | 0.187 | 0.094 | 0.220 | 0.355 | -0.429 | 0.011 | 0.067 | -0.032 | -0.098 |
| sd | (0.081)** | (0.123) | (0.174) | (0.089)** | (0.098) | (0.116)* | (0.340) | (0.647) | (0.870) | (0.381) | (0.452) | (0.557) |
| obs | 12279 | 12279 | 12279 | 9582 | 7035 | 5019 | 11672 | 11672 | 11672 | 9107 | 6873 | 4948 |
| **# of student comp** | | | | | | | | | | | | |
| coef | 0.774 | 0.780 | 1.659 | 0.743 | 0.831 | 1.408 | 2.736 | 3.043 | 4.634 | 2.823 | 2.427 | 3.159 |
| sd | (0.593) | (0.999) | (1.456) | (0.622) | (0.776) | (0.959) | (1.324)** | (1.932) | (2.176)** | (1.447)* | (1.605) | (1.835)* |
| obs | 12349 | 12349 | 12349 | 9637 | 7079 | 5054 | 11754 | 11754 | 11754 | 9171 | 6922 | 4975 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget(divided by 104) on 2009´s equipment items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.21: Effect on teacher and student characteristics, 2009**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **teacher/student ratio** | | | | | | |
| | 0.017 | 0.008 | 0.019 | 0.019 | 0.004 | 0.011 |
| | (0.008)** | (0.013) | (0.016) | (0.010)** | (0.011) | (0.011) |
| | 24402 | 24402 | 24402 | 19111 | 14278 | 10246 |
| **% of teachers with higher education degree** | | | | | | |
| | 0.183 | 0.245 | 0.178 | 0.191 | 0.241 | 0.198 |
| | (0.069)*** | (0.132)* | (0.216) | (0.084)** | (0.098)** | (0.125) |
| | 24402 | 24402 | 24402 | 19111 | 14278 | 10246 |
| **% of teachers with postgraduate degree** | | | | | | |
| | 0.101 | 0.205 | 0.192 | 0.128 | 0.150 | 0.149 |
| | (0.052)** | (0.081)** | (0.123) | (0.060)** | (0.062)** | (0.072)** |
| | 24402 | 24402 | 24402 | 19111 | 14278 | 10246 |
| **% of female teachers** | | | | | | |
| | 0.068 | 0.153 | 0.274 | 0.054 | 0.084 | 0.155 |
| | (0.066) | (0.104) | (0.134)** | (0.072) | (0.077) | (0.089)* |
| | 24402 | 24402 | 24402 | 19111 | 14278 | 10246 |
| **% of female students** | | | | | | |
| | 0.008 | 0.002 | 0.008 | 0.012 | 0.014 | -0.006 |
| | (0.014) | (0.025) | (0.041) | (0.017) | (0.019) | (0.023) |
| | 24447 | 24447 | 24447 | 19145 | 14295 | 10259 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s teacher and student characteristics. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.22: Effect on teacher and student characteristics by municipality education, 2009**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **teacher/student ratio** | | | | | | | | | | | | |
| | 0.012 | -0.007 | -0.013 | 0.007 | -0.000 | 0.000 | 0.026 | 0.025 | 0.051 | 0.034 | 0.009 | 0.022 |
| | (0.011) | (0.015) | (0.022) | (0.012) | (0.013) | (0.014) | (0.017) | (0.025) | (0.026)* | (0.019)* | (0.022) | (0.023) |
| | 12244 | 12244 | 12244 | 9573 | 7041 | 5038 | 12158 | 12158 | 12158 | 9538 | 7237 | 5208 |
| **% of teachers with higher education degree** | | | | | | | | | | | | |
| | 0.141 | 0.151 | 0.274 | 0.123 | 0.145 | 0.141 | 0.233 | 0.349 | 0.066 | 0.272 | 0.352 | 0.264 |
| | (0.111) | (0.201) | (0.316) | (0.126) | (0.154) | (0.200) | (0.107)** | (0.215) | (0.336) | (0.134)** | (0.156)** | (0.195) |
| | 12244 | 12244 | 12244 | 9573 | 7041 | 5038 | 12158 | 12158 | 12158 | 9538 | 7237 | 5208 |
| **% of teachers with postgraduate degree** | | | | | | | | | | | | |
| | 0.036 | 0.077 | 0.091 | 0.054 | 0.047 | 0.046 | 0.166 | 0.334 | 0.288 | 0.200 | 0.257 | 0.255 |
| | (0.045) | (0.072) | (0.113) | (0.050) | (0.052) | (0.064) | (0.084)** | (0.130)** | (0.178) | (0.096)** | (0.103)** | (0.117)** |
| | 12244 | 12244 | 12244 | 9573 | 7041 | 5038 | 12158 | 12158 | 12158 | 9538 | 7237 | 5208 |
| **% of female teachers** | | | | | | | | | | | | |
| | -0.039 | 0.130 | 0.405 | -0.029 | 0.012 | 0.149 | 0.172 | 0.145 | 0.082 | 0.133 | 0.140 | 0.123 |
| | (0.100) | (0.163) | (0.198)** | (0.109) | (0.128) | (0.148) | (0.085)** | (0.133) | (0.179) | (0.096) | (0.107) | (0.116) |
| | 12244 | 12244 | 12244 | 9573 | 7041 | 5038 | 12158 | 12158 | 12158 | 9538 | 7237 | 5208 |
| **% of female students** | | | | | | | | | | | | |
| | -0.012 | -0.003 | -0.006 | 0.003 | 0.000 | -0.013 | 0.029 | 0.011 | 0.022 | 0.020 | 0.029 | -0.001 |
| | (0.024) | (0.038) | (0.069) | (0.027) | (0.029) | (0.034) | (0.026) | (0.041) | (0.054) | (0.027) | (0.032) | (0.034) |
| | 12263 | 12263 | 12263 | 9590 | 7051 | 5045 | 12184 | 12184 | 12184 | 9555 | 7244 | 5214 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget(divided by 104) on 2009´s teacher and student characteristics. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.23: Descriptive Statistics in 2007, schools with 51-149 students**

| | N | mean | s.d. | min | max |
|---|---|---|---|---|---|
| Panel A: General school characteristics | | | | | |
| state-run schools | 16724 | 0.176 | 0.381 | 0 | 1 |
| urban | 16724 | 0.321 | 0.467 | 0 | 1 |
| North region | 16724 | 0.102 | 0.302 | 0 | 1 |
| Northeast region | 16724 | 0.517 | 0.500 | 0 | 1 |
| Southeast region | 16724 | 0.167 | 0.373 | 0 | 1 |
| South region | 16724 | 0.170 | 0.376 | 0 | 1 |
| Central region | 16724 | 0.039 | 0.193 | 0 | 1 |
| teacher/student ratio | 16722 | 0.064 | 0.033 | 0.007 | 0.407 |
| % of teachers with higher education degree | 16722 | 0.481 | 0.378 | 0 | 1 |
| % of teachers with postgraduate degree | 16722 | 0.134 | 0.238 | 0 | 1 |
| % of female teachers | 16722 | 0.840 | 0.211 | 0 | 1 |
| % of female students | 16724 | 0.465 | 0.063 | 0 | 0.990 |
| Panel B: School academic indices | | | | | |
| pass rate, primary | 16598 | 80.799 | 14.624 | 0 | 100 |
| failure rate, primary | 16598 | 13.929 | 11.183 | 0 | 100 |
| dropout rate, primary | 16598 | 5.273 | 7.460 | 0 | 83.3 |
| Panel C: School physical infrastructure | | | | | |
| school building | 16724 | 0.972 | 0.166 | 0 | 1 |
| principal office | 16724 | 0.538 | 0.499 | 0 | 1 |
| teacher office | 16724 | 0.359 | 0.480 | 0 | 1 |
| computer lab | 16724 | 0.112 | 0.315 | 0 | 1 |
| science lab | 16724 | 0.033 | 0.179 | 0 | 1 |
| sport court | 16724 | 0.189 | 0.391 | 0 | 1 |
| kitchen | 16724 | 0.911 | 0.284 | 0 | 1 |
| library | 16724 | 0.263 | 0.440 | 0 | 1 |
| playground | 16724 | 0.112 | 0.315 | 0 | 1 |
| classrooms | 16724 | 4.397 | 2.706 | 1 | 60 |
| Panel D: School equipment infrastructure | | | | | |
| TV | 16724 | 0.659 | 0.474 | 0 | 1 |
| VHS | 16724 | 0.478 | 0.500 | 0 | 1 |
| DVD player | 16724 | 0.511 | 0.500 | 0 | 1 |
| Parabolic antenna | 16724 | 0.253 | 0.435 | 0 | 1 |
| Copy machine | 16724 | 0.128 | 0.334 | 0 | 1 |
| Slide projector | 16724 | 0.202 | 0.402 | 0 | 1 |
| Printing machine | 16724 | 0.355 | 0.479 | 0 | 1 |
| # of computers | 16724 | 1.859 | 4.457 | 0 | 108 |
| Having student computers | 16724 | 0.141 | 0.348 | 0 | 1 |
| Having computers | 16724 | 0.390 | 0.488 | 0 | 1 |
| Having internet | 16724 | 0.131 | 0.337 | 0 | 1 |
| # of adm comp | 15653 | 0.595 | 1.137 | 0 | 26 |
| # of student comp | 15425 | 1.198 | 3.619 | 0 | 82 |

Notes: This table reports descriptive statistics on several school characteristics in 2007. The school sample considered include schools with 51-149 students in 2007 that received transfers from PDDE.

**Table 3.24: First-stage results, 2009 (schools with 51-149 students)**

| Dependent variable | (PDDE 2008-2009)/$10^4$ | | | | | | Probability of having school committee/2008-09 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **1{z>0}** | | | | | | | | | | | | |
| Coef. | 0.138 | 0.125 | 0.105 | 0.123 | 0.116 | 0.114 | -0.016 | 0.008 | -0.003 | -0.000 | -0.002 | -0.002 |
| sd | (0.005)*** | (0.007)*** | (0.009)*** | (0.007)*** | (0.007)*** | (0.008)*** | (0.003)*** | (0.005) | (0.007) | (0.002) | (0.002) | (0.002) |
| obs | 16724 | 16724 | 16724 | 8225 | 6574 | 5040 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| R-squared | 0.593 | 0.593 | 0.594 | 0.534 | 0.529 | 0.519 | 0.025 | 0.029 | 0.030 | 0.002 | 0.004 | 0.002 |
| F-test | 902.447 | 336.094 | 133.895 | 349.418 | 256.748 | 190.449 | 24.212 | 2.401 | 0.159 | 0.001 | 1.062 | 0.588 |
| Polynomial form: | | | | | | | | | | | | |
| Linear | X | | | X | X | X | X | | | X | X | X |
| Quadratic | | X | | | | | | X | | | | |
| Cubic | | | X | | | | | | X | | | |
| Sample: | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |

Note: OLS estimates of the effect of having at least 100 students in 2007 on 2008-2009 autonomous budget (divided by $10^4$) and on the presence of having school committee in the period 2008-09 (measured as 0/1). The variable 1{z>0} indicates that the school has 100 students or more. Regressions include as controls: regional dummies, urban dummy, state-run dummy. The school sample considered includes schools with 51-149 students in 2007 that received PDDE transfers in the period 2008-09. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.25: Effect on student performance, 2009 (schools with 51-149 students)**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **pass rate, primary** | | | | | | | |
| coef | -1.434 | 1.926 | 1.086 | 5.204 | 2.329 | 5.745 | 1.222 |
| sd | (0.412)*** | (2.161) | (3.418) | (5.563) | (3.261) | (4.046) | (4.479) |
| obs | 16344 | 16344 | 16344 | 16344 | 8042 | 6422 | 4927 |
| **failure rate, primary** | | | | | | | |
| coef | 0.414 | -0.081 | -1.133 | -4.752 | -1.343 | -4.269 | -0.701 |
| sd | (0.359) | (1.730) | (2.765) | (4.658) | (2.575) | (3.202) | (3.487) |
| obs | 16344 | 16344 | 16344 | 16344 | 8042 | 6422 | 4927 |
| **dropout rate, primary** | | | | | | | |
| coef | 0.728 | -1.417 | 0.540 | 0.387 | -0.090 | -0.848 | -0.326 |
| sd | (0.196)*** | (0.938) | (1.536) | (2.555) | (1.461) | (1.698) | (2.021) |
| obs | 16344 | 16344 | 16344 | 16344 | 8042 | 6422 | 4927 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s student performance indices. The school sample considered includes schools with 51-149 students in 2007. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.26: Effect on aggregate indices, 2009 (schools with 51-149 students)**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Physical Infrastructure Index** | | | | | | | |
| coef | 0.225 | -0.011 | 0.000 | -0.016 | -0.026 | 0.038 | -0.021 |
| sd | (0.012)*** | (0.060) | (0.099) | (0.148) | (0.094) | (0.112) | (0.119) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **Equipment Index** | | | | | | | |
| coef | 0.346 | 0.169 | 0.157 | 0.026 | 0.101 | 0.097 | 0.101 |
| sd | (0.015)*** | (0.054)*** | (0.091)* | (0.129) | (0.082) | (0.097) | (0.108) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s infrastructure aggregate indices. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index takes into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. The school sample considered includes schools with 51-149 students in 2007. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.27: Effect on physical infrastructure items, 2009 (schools with 51-149 students)**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **school building** | | | | | | | |
| coef | 0.015 | -0.023 | 0.011 | -0.015 | -0.028 | -0.000 | 0.020 |
| sd | (0.004)*** | (0.027) | (0.046) | (0.076) | (0.044) | (0.052) | (0.067) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **principal office** | | | | | | | |
| coef | 0.225 | -0.148 | 0.030 | 0.105 | -0.003 | 0.112 | 0.070 |
| sd | (0.016)*** | (0.079)* | (0.133) | (0.213) | (0.125) | (0.153) | (0.174) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **teacher office** | | | | | | | |
| coef | 0.124 | -0.010 | -0.020 | -0.052 | -0.001 | -0.028 | 0.010 |
| sd | (0.012)*** | (0.069) | (0.111) | (0.128) | (0.102) | (0.118) | (0.115) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **computer lab** | | | | | | | |
| coef | 0.189 | 0.067 | -0.065 | -0.136 | -0.082 | -0.050 | -0.093 |
| sd | (0.011)*** | (0.069) | (0.108) | (0.173) | (0.111) | (0.136) | (0.139) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **science lab** | | | | | | | |
| coef | 0.045 | 0.017 | 0.032 | -0.003 | 0.032 | 0.011 | -0.011 |
| sd | (0.007)*** | (0.027) | (0.037) | (0.047) | (0.037) | (0.040) | (0.041) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **sport court** | | | | | | | |
| coef | 0.054 | 0.031 | 0.065 | 0.027 | 0.038 | 0.098 | 0.034 |
| sd | (0.007)*** | (0.049) | (0.083) | (0.140) | (0.078) | (0.097) | (0.110) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **kitchen** | | | | | | | |
| coef | 0.032 | -0.012 | -0.014 | 0.065 | -0.019 | 0.030 | 0.042 |
| sd | (0.006)*** | (0.042) | (0.071) | (0.104) | (0.065) | (0.075) | (0.086) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **library** | | | | | | | |
| coef | 0.120 | 0.117 | 0.077 | -0.008 | 0.089 | 0.090 | 0.019 |
| sd | (0.011)*** | (0.068)* | (0.107) | (0.147) | (0.102) | (0.124) | (0.128) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **playground** | | | | | | | |
| coef | 0.019 | -0.039 | 0.010 | 0.032 | -0.023 | 0.001 | -0.013 |
| sd | (0.006)*** | (0.044) | (0.072) | (0.108) | (0.072) | (0.083) | (0.098) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **classrooms** | | | | | | | |
| coef | 1.169 | -0.180 | -0.251 | -0.723 | -0.258 | -0.560 | -0.958 |
| sd | (0.171)*** | (0.333) | (0.536) | (0.689) | (0.502) | (0.550) | (0.583) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s physical infrastructure items. The school sample considered includes schools with 51-149 students in 2007. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.28: Effect on equipment infrastructure items, 2009 (schools with 51-149 students)**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **TV** | | | | | | | |
| coef | 0.170 | 0.038 | 0.121 | 0.015 | 0.092 | 0.056 | 0.001 |
| sd | (0.014)*** | (0.080) | (0.137) | (0.214) | (0.126) | (0.154) | (0.168) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **VHS** | | | | | | | |
| coef | 0.062 | 0.087 | 0.053 | 0.067 | 0.104 | 0.088 | 0.049 |
| sd | (0.011)*** | (0.064) | (0.096) | (0.138) | (0.101) | (0.112) | (0.110) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **DVD player** | | | | | | | |
| coef | 0.268 | -0.018 | -0.049 | -0.332 | -0.089 | -0.139 | -0.175 |
| sd | (0.018)*** | (0.087) | (0.161) | (0.243) | (0.143) | (0.173) | (0.203) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **Parabolic antenna** | | | | | | | |
| coef | 0.097 | 0.114 | 0.161 | 0.014 | 0.185 | 0.095 | 0.084 |
| sd | (0.012)*** | (0.076) | (0.133) | (0.208) | (0.129) | (0.151) | (0.179) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **Copy machine** | | | | | | | |
| coef | 0.131 | 0.168 | 0.020 | -0.093 | 0.008 | 0.024 | -0.011 |
| sd | (0.010)*** | (0.070)** | (0.112) | (0.170) | (0.107) | (0.119) | (0.136) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **Slide projector** | | | | | | | |
| coef | 0.089 | 0.049 | 0.036 | -0.049 | 0.012 | -0.021 | -0.005 |
| sd | (0.008)*** | (0.051) | (0.080) | (0.128) | (0.077) | (0.090) | (0.106) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **Printing machine** | | | | | | | |
| coef | 0.281 | 0.057 | 0.131 | 0.132 | 0.041 | 0.091 | 0.172 |
| sd | (0.015)*** | (0.066) | (0.102) | (0.139) | (0.102) | (0.115) | (0.117) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **# of computers** | | | | | | | |
| coef | 3.393 | -0.714 | -0.869 | -1.108 | -1.678 | -1.225 | -0.894 |
| sd | (0.240)*** | (0.789) | (1.130) | (1.655) | (1.092) | (1.209) | (1.356) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **Having student computers** | | | | | | | |
| coef | 0.199 | 0.065 | -0.026 | 0.002 | -0.048 | 0.043 | 0.022 |
| sd | (0.012)*** | (0.074) | (0.099) | (0.140) | (0.095) | (0.110) | (0.119) |
| obs | 16711 | 16711 | 16711 | 16711 | 8218 | 6570 | 5038 |
| **Having computers** | | | | | | | |
| coef | 0.286 | 0.018 | 0.175 | 0.401 | 0.115 | 0.226 | 0.237 |
| sd | (0.014)*** | (0.074) | (0.112) | (0.166)** | (0.110) | (0.124)* | (0.144)* |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **internet** | | | | | | | |
| coef | 0.157 | 0.141 | 0.027 | 0.029 | 0.043 | 0.004 | 0.030 |
| sd | (0.011)*** | (0.066)** | (0.102) | (0.154) | (0.099) | (0.108) | (0.129) |
| obs | 16707 | 16707 | 16707 | 16707 | 8217 | 6569 | 5038 |
| **# of adm comp** | | | | | | | |
| coef | 0.698 | -0.140 | 0.181 | 0.055 | -0.065 | -0.010 | -0.031 |
| sd | (0.051)*** | (0.209) | (0.339) | (0.572) | (0.320) | (0.401) | (0.479) |
| obs | 15346 | 15346 | 15346 | 15346 | 7524 | 6003 | 4610 |
| **# of student comp** | | | | | | | |
| coef | 2.634 | -0.200 | -0.041 | -1.040 | -1.042 | -0.492 | -0.543 |
| sd | (0.246)*** | (0.688) | (0.970) | (1.495) | (0.941) | (1.026) | (1.245) |
| obs | 15104 | 15104 | 15104 | 15104 | 7365 | 5889 | 4524 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s equipment items. The school sample considered includes schools with 51-149 students in 2007. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.29: Effect on teacher and student characteristics, 2009**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **teacher/student ratio** | | | | | | |
| | 0.003 | -0.002 | -0.002 | -0.002 | 0.005 | -0.004 |
| | (0.005) | (0.008) | (0.014) | (0.007) | (0.009) | (0.010) |
| | 16478 | 16478 | 16478 | 8109 | 6478 | 4974 |
| **% of teachers with higher education degree** | | | | | | |
| | -0.048 | -0.127 | -0.022 | -0.110 | -0.072 | -0.043 |
| | (0.046) | (0.077) | (0.115) | (0.075) | (0.083) | (0.104) |
| | 16478 | 16478 | 16478 | 8109 | 6478 | 4974 |
| **% of teachers with postgraduate degree** | | | | | | |
| | -0.041 | -0.075 | -0.124 | -0.101 | -0.090 | -0.083 |
| | (0.033) | (0.052) | (0.078) | (0.047)** | (0.056) | (0.061) |
| | 16478 | 16478 | 16478 | 8109 | 6478 | 4974 |
| **% of female teachers** | | | | | | |
| | 0.055 | 0.091 | 0.123 | 0.088 | 0.102 | 0.100 |
| | (0.028)* | (0.047)* | (0.082) | (0.042)** | (0.049)** | (0.060)* |
| | 16478 | 16478 | 16478 | 8109 | 6478 | 4974 |
| **% of female students** | | | | | | |
| | 0.001 | -0.014 | -0.000 | -0.011 | 0.003 | -0.007 |
| | (0.010) | (0.015) | (0.021) | (0.014) | (0.016) | (0.017) |
| | 16482 | 16482 | 16482 | 8110 | 6479 | 4974 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s teacher and student characteristics. The school sample considered includes schools with 51-149 students in 2007. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.30: Descriptive Statistics, 2010**

| | N | mean | s.d. | min | max |
|---|---|---|---|---|---|
| Panel A: General school characteristics | | | | | |
| state status | 23698 | 0.079 | 0.270 | 0 | 1 |
| urban | 23698 | 0.094 | 0.291 | 0 | 1 |
| North region | 23698 | 0.181 | 0.385 | 0 | 1 |
| Northeast region | 23698 | 0.570 | 0.495 | 0 | 1 |
| Southeast region | 23698 | 0.126 | 0.332 | 0 | 1 |
| South region | 23698 | 0.100 | 0.300 | 0 | 1 |
| Central region | 23698 | 0.022 | 0.146 | 0 | 1 |
| teacher/student ratio | 23697 | 0.075 | 0.044 | 0.013 | 0.913 |
| % of teachers with higher education degree | 23697 | 0.349 | 0.394 | 0 | 1 |
| % of teachers with postgraduate degree | 23697 | 0.104 | 0.229 | 0 | 1 |
| % of female teachers | 23697 | 0.811 | 0.299 | 0 | 1 |
| % of female students | 23698 | 0.455 | 0.089 | 0 | 1 |
| Panel B: School academic indices | | | | | |
| pass rate, primary | 23564 | 84.470 | 13.988 | 0 | 100 |
| failure rate, primary | 23564 | 11.546 | 11.463 | 0 | 100 |
| dropout rate, primary | 23564 | 3.984 | 7.253 | 0 | 100 |
| Panel C: School physical infrastructure | | | | | |
| school building | 23698 | 0.929 | 0.256 | 0 | 1 |
| principal office | 23698 | 0.329 | 0.470 | 0 | 1 |
| teacher office | 23698 | 0.175 | 0.380 | 0 | 1 |
| computer lab | 23698 | 0.125 | 0.330 | 0 | 1 |
| science lab | 23698 | 0.008 | 0.088 | 0 | 1 |
| sport court | 23698 | 0.074 | 0.262 | 0 | 1 |
| kitchen | 23698 | 0.898 | 0.303 | 0 | 1 |
| library | 23698 | 0.129 | 0.335 | 0 | 1 |
| playground | 23698 | 0.066 | 0.248 | 0 | 1 |
| classrooms | 23698 | 2.570 | 1.869 | 1 | 40 |
| Panel D: School equipment infrastructure | | | | | |
| TV | 23698 | 0.436 | 0.496 | 0 | 1 |
| VHS | 23698 | 0.173 | 0.378 | 0 | 1 |
| DVD player | 23698 | 0.385 | 0.487 | 0 | 1 |
| Parabolic antenna | 23698 | 0.127 | 0.333 | 0 | 1 |
| Copy machine | 23698 | 0.089 | 0.285 | 0 | 1 |
| Slide projector | 23698 | 0.067 | 0.250 | 0 | 1 |
| Printing machine | 23698 | 0.229 | 0.420 | 0 | 1 |
| # of computers | 23698 | 1.595 | 3.912 | 0 | 95 |
| Having student computers | 23698 | 0.181 | 0.385 | 0 | 1 |
| Having computers | 23698 | 0.281 | 0.450 | 0 | 1 |
| Having internet | 23698 | 0.087 | 0.282 | 0 | 1 |
| # of adm comp | 22083 | 0.382 | 0.983 | 0 | 33 |
| # of student comp | 23372 | 1.220 | 3.277 | 0 | 80 |

Notes: This table reports descriptive statistics on several school characteristics in 2010. The school sample considered include schools with 51-149 students in 2010 that received transfers from PDDE.

**Table 3.31: First-stage results, 2012**

| Dependent variable | (PDDE 2011-2012)/$10^4$ | | | | | | Probability of having school committee/2011-12 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **1{z>0}** | | | | | | | | | | | | |
| Coef. | 0.076 | 0.062 | 0.055 | 0.074 | 0.068 | 0.065 | 0.002 | 0.024 | 0.084 | -0.001 | 0.015 | 0.036 |
| sd | (0.002)*** | (0.004)*** | (0.005)*** | (0.003)*** | (0.003)*** | (0.004)*** | (0.011) | (0.016) | (0.022)*** | (0.011) | (0.012) | (0.012)*** |
| obs | 23697 | 23697 | 23697 | 18636 | 14008 | 9967 | 23682 | 23682 | 23682 | 18623 | 13996 | 9958 |
| R-squared | 0.591 | 0.591 | 0.591 | 0.550 | 0.504 | 0.452 | 0.333 | 0.333 | 0.334 | 0.290 | 0.229 | 0.175 |
| F-test | 943.663 | 279.741 | 123.543 | 675.593 | 432.464 | 277.768 | 0.052 | 2.152 | 14.586 | 0.008 | 1.579 | 9.041 |
| Polynomial form: | | | | | | | | | | | | |
| Linear | X | | | X | X | X | X | | | X | X | X |
| Quadratic | | X | | | | | | X | | | | |
| Cubic | | | X | | | | | | X | | | |
| Sample: | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | all | all | all | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |

Notes: OLS estimates of the effect of having at least 51 students in 2010 on 2011-2012 autonomous budget (divided by $10^4$) and on the presence of having school committee in the period 2011-12 (measured as 0/1). The variable 1{z>0} indicates that the school has 51 students or more. Regressions include as controls: regional dummies, urban dummy, state-run dummy. The school sample considered include schools with 20-80 students in 2010 that received PDDE transfers in the period 2011-12. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.32: Effect on student performance, 2012**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **pass rate, primary** | | | | | | | |
| coef | -1.340 | 1.756 | 2.004 | 11.282 | 0.560 | 3.975 | 1.655 |
| sd | (0.592)** | (4.433) | (9.578) | (10.705) | (5.068) | (6.125) | (8.196) |
| obs | 23021 | 23021 | 23021 | 23021 | 18178 | 13676 | 9761 |
| **failure rate, primary** | | | | | | | |
| coef | 0.500 | -1.161 | 4.929 | -1.052 | 1.231 | 1.094 | 3.550 |
| sd | (0.530) | (3.848) | (8.103) | (9.646) | (4.136) | (5.065) | (6.896) |
| obs | 23021 | 23021 | 23021 | 23021 | 18178 | 13676 | 9761 |
| **dropout rate, primary** | | | | | | | |
| coef | 0.735 | -0.697 | -6.623 | -9.617 | -1.832 | -4.989 | -5.082 |
| sd | (0.284)** | (1.998) | (3.581)* | (4.662)** | (2.287) | (2.641)* | (3.126) |
| obs | 23021 | 23021 | 23021 | 23021 | 18178 | 13676 | 9761 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget (divided by $10^4$) on 2012´s student performance indices. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.33: Effect on aggregate indices, 2012**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Physical Infrastructure Index** | | | | | | | |
| coef | 0.286 | 0.042 | 0.012 | -0.295 | 0.071 | 0.033 | -0.056 |
| sd | (0.017)*** | (0.097) | (0.139) | (0.182) | (0.106) | (0.116) | (0.132) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **Equipment Index** | | | | | | | |
| coef | 0.490 | 0.022 | 0.052 | -0.308 | 0.076 | 0.094 | -0.085 |
| sd | (0.027)*** | (0.102) | (0.151) | (0.233) | (0.105) | (0.135) | (0.147) |
| obs | 23136 | 23136 | 23136 | 23136 | 18265 | 13746 | 9811 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget(divided by 104) on 2012´s infrastructure aggregate indices. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.34: Effect on physical infrastructure items, 2012**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **school building** | | | | | | | |
| coef | 0.110 | -0.091 | 0.193 | 0.537 | -0.040 | -0.014 | 0.097 |
| sd | (0.023)*** | (0.180) | (0.337) | (0.445) | (0.203) | (0.248) | (0.299) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **principal office** | | | | | | | |
| coef | 0.224 | 0.002 | -0.204 | -0.259 | -0.056 | -0.107 | -0.168 |
| sd | (0.017)*** | (0.139) | (0.187) | (0.188) | (0.151) | (0.174) | (0.190) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **teacher office** | | | | | | | |
| coef | 0.146 | 0.144 | 0.078 | -0.030 | 0.156 | 0.096 | 0.101 |
| sd | (0.015)*** | (0.110) | (0.175) | (0.223) | (0.124) | (0.141) | (0.169) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **computer lab** | | | | | | | |
| coef | 0.310 | -0.152 | -0.117 | -0.257 | -0.070 | -0.135 | -0.166 |
| sd | (0.023)*** | (0.130) | (0.230) | (0.348) | (0.147) | (0.177) | (0.204) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **science lab** | | | | | | | |
| coef | 0.003 | -0.001 | 0.022 | -0.018 | 0.008 | 0.016 | -0.037 |
| sd | (0.003) | (0.030) | (0.049) | (0.077) | (0.033) | (0.038) | (0.045) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **sport court** | | | | | | | |
| coef | 0.078 | 0.051 | -0.056 | -0.194 | 0.039 | 0.011 | -0.019 |
| sd | (0.009)*** | (0.099) | (0.169) | (0.232) | (0.109) | (0.133) | (0.157) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **kitchen** | | | | | | | |
| coef | 0.122 | -0.162 | -0.021 | -0.165 | -0.116 | -0.136 | -0.059 |
| sd | (0.014)*** | (0.061)*** | (0.090) | (0.113) | (0.059)* | (0.067)** | (0.067) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **library** | | | | | | | |
| coef | 0.128 | 0.015 | -0.088 | -0.218 | -0.014 | 0.011 | -0.069 |
| sd | (0.013)*** | (0.084) | (0.142) | (0.177) | (0.094) | (0.109) | (0.121) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **playground** | | | | | | | |
| coef | 0.047 | 0.161 | 0.233 | 0.206 | 0.163 | 0.201 | 0.192 |
| sd | (0.009)*** | (0.062)*** | (0.081)*** | (0.119)* | (0.067)** | (0.070)*** | (0.077)** |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **classrooms** | | | | | | | |
| coef | 1.220 | 2.764 | 4.916 | 4.199 | 3.088 | 3.920 | 4.237 |
| sd | (0.241)*** | (2.658) | (4.589) | (4.894) | (2.920) | (3.527) | (4.165) |
| obs | 23539 | 23539 | 23539 | 23539 | 18601 | 14019 | 10014 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget(divided by $10^4$) on 2012´s physical infrastructure items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.35: Effect on equipment infrastructure items, 2012**

| | OLS | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **TV** | | | | | | | |
| coef | 0.396 | -0.126 | 0.033 | 0.197 | -0.129 | -0.021 | 0.024 |
| sd | (0.029)*** | (0.144) | (0.246) | (0.340) | (0.160) | (0.189) | (0.225) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **VHS** | | | | | | | |
| coef | 0.047 | -0.049 | -0.307 | -0.601 | -0.072 | -0.179 | -0.322 |
| sd | (0.011)*** | (0.087) | (0.152)** | (0.183)*** | (0.096) | (0.110) | (0.128)** |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **DVD player** | | | | | | | |
| coef | 0.446 | 0.005 | 0.357 | 0.415 | 0.064 | 0.183 | 0.267 |
| sd | (0.030)*** | (0.126) | (0.188)* | (0.250)* | (0.136) | (0.159) | (0.186) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **Parabolic antenna** | | | | | | | |
| coef | 0.121 | 0.134 | 0.059 | 0.008 | 0.117 | 0.099 | 0.070 |
| sd | (0.012)*** | (0.089) | (0.136) | (0.180) | (0.095) | (0.107) | (0.121) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **Copy machine** | | | | | | | |
| coef | 0.242 | 0.014 | -0.005 | -0.439 | 0.068 | 0.027 | -0.108 |
| sd | (0.017)*** | (0.098) | (0.153) | (0.177)** | (0.109) | (0.130) | (0.134) |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **Slide projector** | | | | | | | |
| coef | 0.054 | -0.062 | -0.198 | -0.309 | -0.101 | -0.081 | -0.160 |
| sd | (0.007)*** | (0.057) | (0.112)* | (0.134)** | (0.065) | (0.088) | (0.093)* |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **Printing machine** | | | | | | | |
| coef | 0.430 | 0.007 | -0.077 | -0.183 | 0.037 | 0.008 | -0.082 |
| sd | (0.026)*** | (0.142) | (0.290) | (0.470) | (0.162) | (0.204) | (0.263) |
| p-value | 0.000 | 0.959 | 0.792 | 0.698 | 0.821 | 0.967 | 0.756 |
| obs | 23900 | 23900 | 23900 | 23900 | 18810 | 14148 | 10077 |
| **# of computers** | | | | | | | |
| coef | 3.159 | -4.901 | -6.163 | -0.439 | -4.677 | -6.513 | -7.211 |
| sd | (0.342)*** | (4.702) | (6.718) | (4.608) | (5.462) | (6.597) | (6.380) |
| obs | 23539 | 23539 | 23539 | 23539 | 18601 | 14019 | 10014 |
| **Having student computers** | | | | | | | |
| coef | 0.364 | 0.078 | 0.179 | -0.074 | 0.184 | 0.146 | -0.005 |
| sd | (0.027)*** | (0.142) | (0.219) | (0.336) | (0.149) | (0.184) | (0.203) |
| obs | 23497 | 23497 | 23497 | 23497 | 18474 | 13875 | 9874 |
| **Having computers** | | | | | | | |
| coef | 0.387 | 0.043 | 0.344 | 0.098 | 0.167 | 0.296 | 0.072 |
| sd | (0.027)*** | (0.130) | (0.212) | (0.335) | (0.136) | (0.173)* | (0.213) |
| obs | 23539 | 23539 | 23539 | 23539 | 18601 | 14019 | 10014 |
| **internet** | | | | | | | |
| coef | 0.178 | 0.056 | -0.241 | -0.288 | -0.026 | -0.124 | -0.188 |
| sd | (0.012)*** | (0.085) | (0.151) | (0.213) | (0.087) | (0.109) | (0.134) |
| obs | 23539 | 23539 | 23539 | 23539 | 18601 | 14019 | 10014 |
| **# of adm comp** | | | | | | | |
| coef | 0.581 | -0.134 | 0.021 | -0.201 | -0.082 | 0.061 | -0.107 |
| sd | (0.053)*** | (0.311) | (0.429) | (0.643) | (0.348) | (0.344) | (0.379) |
| obs | 19381 | 19381 | 19381 | 19381 | 15190 | 11388 | 8104 |
| **# of student comp** | | | | | | | |
| coef | 2.650 | -0.340 | 0.262 | -1.767 | 0.609 | -0.252 | -0.874 |
| sd | (0.228)*** | (1.463) | (2.280) | (3.486) | (1.608) | (1.812) | (2.082) |
| obs | 23239 | 23239 | 23239 | 23239 | 18238 | 13691 | 9736 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget (divided by $10^4$) on 2012´s equipment items. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table 3.36: Effect on teacher and student characteristics, 2012**

| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **teacher/student ratio** | | | | | | |
| | 0.020 | -0.028 | -0.017 | 0.003 | -0.009 | -0.004 |
| | (0.015) | (0.026) | (0.029) | (0.015) | (0.018) | (0.022) |
| | 22654 | 22654 | 22654 | 17862 | 13416 | 9573 |
| **% of teachers with higher education degree** | | | | | | |
| | 0.001 | -0.364 | -0.520 | -0.100 | -0.154 | -0.312 |
| | (0.107) | (0.154)** | (0.194)*** | (0.109) | (0.124) | (0.136)** |
| | 22654 | 22654 | 22654 | 17862 | 13416 | 9573 |
| **% of teachers with postgraduate degree** | | | | | | |
| | 0.133 | -0.089 | -0.035 | 0.067 | 0.056 | 0.023 |
| | (0.082) | (0.129) | (0.176) | (0.087) | (0.105) | (0.120) |
| | 22654 | 22654 | 22654 | 17862 | 13416 | 9573 |
| **% of female teachers** | | | | | | |
| | 0.043 | -0.222 | -0.128 | -0.027 | -0.110 | -0.057 |
| | (0.084) | (0.133)* | (0.183) | (0.091) | (0.114) | (0.123) |
| | 22654 | 22654 | 22654 | 17862 | 13416 | 9573 |
| **% of female students** | | | | | | |
| | 0.034 | -0.000 | 0.016 | 0.028 | 0.019 | 0.019 |
| | (0.023) | (0.039) | (0.049) | (0.027) | (0.029) | (0.032) |
| | 23168 | 23168 | 23168 | 18295 | 13774 | 9830 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget (divided by $10^4$) on 2012´steacher and student characteristics. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.1: Effect on student performance by municipality education, 2008**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **pass rate, primary** | | | | | | | | | | | | |
| coef | 4.296 | -14.007 | -15.775 | 0.124 | -3.479 | -14.295 | 15.150 | 3.023 | 2.233 | 10.654 | 5.378 | 9.412 |
| sd | (5.965) | (7.909)* | (10.303) | (6.022) | (6.458) | (7.254)** | (5.755)*** | (8.449) | (9.622) | (5.870)* | (6.878) | (7.773) |
| obs | 15275 | 15275 | 15275 | 11992 | 8886 | 6396 | 15069 | 15069 | 15069 | 11814 | 8966 | 6464 |
| **failure rate, primary** | | | | | | | | | | | | |
| coef | -1.570 | 13.772 | 18.845 | 1.710 | 5.995 | 13.939 | -12.477 | -3.575 | -2.491 | -9.901 | -4.816 | -8.191 |
| sd | (5.048) | (7.226)* | (10.184)* | (5.239) | (5.942) | (6.600)** | (5.636)** | (8.374) | (10.225) | (5.829)* | (6.702) | (7.970) |
| obs | 15275 | 15275 | 15275 | 11992 | 8886 | 6396 | 15069 | 15069 | 15069 | 11814 | 8966 | 6464 |
| **dropout rate, primary** | | | | | | | | | | | | |
| coef | -2.994 | 0.405 | -3.867 | -1.954 | -2.453 | -0.347 | -3.393 | 0.975 | 0.062 | -1.119 | -0.762 | -1.428 |
| sd | (3.461) | (4.002) | (4.544) | (3.853) | (3.617) | (3.610) | (2.721) | (3.598) | (3.762) | (2.882) | (3.240) | (3.726) |
| obs | 15275 | 15275 | 15275 | 11992 | 8886 | 6396 | 15069 | 15069 | 15069 | 11814 | 8966 | 6464 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s student performance indices. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.2: Effect on aggregate indices by municipality education, 2008**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Physical Infrastructure Index** | | | | | | | | | | | | |
| coef | -0.094 | -0.223 | -0.301 | -0.123 | -0.127 | -0.262 | 0.074 | -0.115 | 0.027 | -0.050 | -0.075 | 0.048 |
| sd | (0.064) | (0.092)** | (0.112)*** | (0.068)* | (0.080) | (0.081)*** | (0.122) | (0.145) | (0.185) | (0.119) | (0.133) | (0.130) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **Equipment Index** | | | | | | | | | | | | |
| coef | 0.171 | 0.054 | -0.024 | 0.142 | 0.096 | 0.027 | 0.702 | 0.336 | 0.555 | 0.597 | 0.419 | 0.446 |
| sd | (0.094)* | (0.148) | (0.205) | (0.101) | (0.115) | (0.134) | (0.154)*** | (0.178)* | (0.190)*** | (0.166)*** | (0.177)** | (0.170)*** |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s infrastructure aggregate indices. The sample is divided considering the median of the proportion of literate adults. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.3: Effect on physical infrastructure items by municipality education, 2008**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **school building** | | | | | | | | | | | | |
| coef | -0.088 | -0.030 | -0.095 | -0.062 | -0.048 | -0.060 | 0.005 | -0.110 | -0.165 | -0.032 | -0.057 | -0.066 |
| sd | (0.042)** | (0.054) | (0.070) | (0.042) | (0.048) | (0.051) | (0.057) | (0.093) | (0.113) | (0.062) | (0.072) | (0.085) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **principal office** | | | | | | | | | | | | |
| coef | -0.091 | -0.283 | -0.287 | -0.196 | -0.149 | -0.220 | 0.116 | 0.061 | -0.008 | 0.110 | 0.118 | 0.156 |
| sd | (0.104) | (0.141)** | (0.188) | (0.112)* | (0.122) | (0.137) | (0.098) | (0.124) | (0.138) | (0.104) | (0.109) | (0.131) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **teacher office** | | | | | | | | | | | | |
| coef | -0.076 | -0.026 | 0.009 | -0.046 | -0.037 | -0.070 | -0.045 | -0.072 | -0.093 | -0.073 | -0.050 | -0.015 |
| sd | (0.066) | (0.086) | (0.098) | (0.068) | (0.079) | (0.090) | (0.104) | (0.163) | (0.212) | (0.115) | (0.132) | (0.159) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **computer lab** | | | | | | | | | | | | |
| coef | -0.017 | -0.006 | -0.061 | -0.007 | -0.007 | -0.048 | 0.107 | 0.065 | 0.047 | 0.049 | 0.096 | 0.096 |
| sd | (0.035) | (0.045) | (0.057) | (0.035) | (0.036) | (0.041) | (0.092) | (0.110) | (0.121) | (0.096) | (0.096) | (0.105) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **science lab** | | | | | | | | | | | | |
| coef | -0.026 | -0.016 | -0.033 | -0.018 | -0.019 | -0.027 | 0.018 | 0.036 | 0.093 | 0.018 | 0.012 | 0.054 |
| sd | (0.012)** | (0.016) | (0.019)* | (0.011) | (0.013) | (0.014)* | (0.023) | (0.032) | (0.035)*** | (0.026) | (0.026) | (0.026)** |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **sport court** | | | | | | | | | | | | |
| coef | -0.007 | -0.031 | -0.053 | -0.002 | -0.021 | -0.044 | 0.039 | -0.160 | -0.107 | -0.001 | -0.116 | -0.108 |
| sd | (0.027) | (0.033) | (0.042) | (0.028) | (0.028) | (0.031) | (0.063) | (0.072)** | (0.091) | (0.064) | (0.068)* | (0.060)* |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **kitchen** | | | | | | | | | | | | |
| coef | 0.053 | -0.130 | -0.232 | 0.007 | -0.029 | -0.117 | 0.076 | -0.011 | 0.054 | 0.012 | 0.009 | 0.059 |
| sd | (0.099) | (0.133) | (0.124)* | (0.106) | (0.119) | (0.127) | (0.087) | (0.130) | (0.168) | (0.091) | (0.102) | (0.115) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **library** | | | | | | | | | | | | |
| coef | 0.006 | -0.028 | 0.021 | -0.013 | -0.017 | -0.035 | -0.010 | 0.007 | 0.094 | -0.032 | 0.014 | 0.037 |
| sd | (0.042) | (0.067) | (0.056) | (0.047) | (0.054) | (0.058) | (0.066) | (0.083) | (0.106) | (0.070) | (0.073) | (0.082) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **playground** | | | | | | | | | | | | |
| coef | 0.019 | -0.024 | -0.022 | 0.007 | 0.006 | -0.011 | -0.047 | -0.117 | -0.100 | -0.083 | -0.123 | -0.105 |
| sd | (0.018) | (0.016) | (0.019) | (0.016) | (0.017) | (0.016) | (0.065) | (0.083) | (0.105) | (0.067) | (0.073)* | (0.077) |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **classrooms** | | | | | | | | | | | | |
| coef | 0.203 | -0.059 | -0.531 | 0.238 | -0.052 | -0.023 | 0.151 | 0.091 | 0.503 | 0.074 | 0.199 | 0.355 |
| sd | (0.312) | (0.491) | (0.632) | (0.332) | (0.366) | (0.432) | (0.361) | (0.400) | (0.363) | (0.327) | (0.349) | (0.323) |
| obs | 15481 | 15481 | 15481 | 12152 | 9010 | 6491 | 15475 | 15475 | 15475 | 12141 | 9207 | 6644 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget (divided by $10^4$) on 2008´s physical infrastructure items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.4: Effect on equipment infrastructure items by municipality education, 2008**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **TV** | | | | | | | | | | | | |
| coef | 0.202 | -0.161 | -0.329 | 0.099 | -0.008 | -0.098 | 0.348 | 0.159 | 0.243 | 0.304 | 0.227 | 0.174 |
| sd | (0.121)* | (0.127) | (0.165)** | (0.118) | (0.123) | (0.126) | (0.108)*** | (0.157) | (0.196) | (0.119)** | (0.132)* | (0.151) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **VHS** | | | | | | | | | | | | |
| coef | -0.094 | 0.001 | -0.141 | -0.061 | -0.031 | -0.051 | 0.119 | 0.058 | 0.256 | 0.092 | 0.082 | 0.030 |
| sd | (0.056)* | (0.094) | (0.095) | (0.060) | (0.065) | (0.077) | (0.115) | (0.182) | (0.226) | (0.118) | (0.125) | (0.164) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **DVD player** | | | | | | | | | | | | |
| coef | 0.395 | 0.033 | -0.025 | 0.294 | 0.174 | 0.054 | 0.541 | 0.353 | 0.220 | 0.525 | 0.405 | 0.323 |
| sd | (0.121)*** | (0.178) | (0.221) | (0.131)** | (0.149) | (0.160) | (0.143)*** | (0.188)* | (0.232) | (0.155)*** | (0.165)** | (0.179)* |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **Parabolic antenna** | | | | | | | | | | | | |
| coef | 0.037 | 0.134 | 0.127 | 0.071 | 0.077 | 0.106 | 0.070 | 0.045 | -0.021 | 0.059 | 0.031 | 0.094 |
| sd | (0.049) | (0.062)** | (0.068)* | (0.051) | (0.057) | (0.062)* | (0.110) | (0.174) | (0.238) | (0.116) | (0.130) | (0.157) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **Copy machine** | | | | | | | | | | | | |
| coef | 0.034 | -0.003 | -0.047 | 0.034 | 0.044 | -0.020 | 0.176 | 0.118 | 0.152 | 0.173 | 0.089 | 0.169 |
| sd | (0.059) | (0.078) | (0.105) | (0.063) | (0.072) | (0.073) | (0.090)* | (0.122) | (0.160) | (0.096)* | (0.106) | (0.120) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **Slide projector** | | | | | | | | | | | | |
| coef | -0.002 | -0.001 | -0.007 | -0.005 | -0.001 | -0.006 | 0.102 | -0.003 | 0.012 | 0.086 | 0.045 | -0.026 |
| sd | (0.017) | (0.025) | (0.033) | (0.019) | (0.021) | (0.024) | (0.059)* | (0.075) | (0.080) | (0.064) | (0.068) | (0.074) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **Printing machine** | | | | | | | | | | | | |
| coef | -0.039 | -0.011 | -0.002 | -0.033 | -0.037 | -0.034 | 0.272 | 0.117 | 0.310 | 0.220 | 0.145 | 0.189 |
| sd | (0.039) | (0.048) | (0.054) | (0.041) | (0.045) | (0.047) | (0.103)*** | (0.132) | (0.160)* | (0.106)** | (0.118) | (0.127) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **# of computers** | | | | | | | | | | | | |
| coef | 0.135 | 0.618 | 1.029 | 0.174 | 0.415 | 0.716 | 1.352 | 2.149 | 4.218 | 1.007 | 2.003 | 2.252 |
| sd | (0.379) | (0.442) | (0.528)* | (0.382) | (0.419) | (0.435)* | (0.936) | (1.112)* | (1.079)*** | (0.994) | (1.025)* | (1.023)** |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **Having student computers** | | | | | | | | | | | | |
| coef | 0.007 | 0.033 | 0.019 | 0.015 | 0.018 | 0.024 | 0.440 | 0.277 | 0.371 | 0.369 | 0.353 | 0.355 |
| sd | (0.035) | (0.052) | (0.067) | (0.036) | (0.041) | (0.047) | (0.102)*** | (0.118)** | (0.118)*** | (0.104)*** | (0.113)*** | (0.114)*** |
| obs | 15495 | 15495 | 15495 | 12163 | 9018 | 6496 | 15487 | 15487 | 15487 | 12149 | 9214 | 6651 |
| **Having computers** | | | | | | | | | | | | |
| coef | 0.074 | 0.133 | 0.146 | 0.083 | 0.100 | 0.084 | 0.176 | 0.149 | 0.389 | 0.139 | 0.146 | 0.270 |
| sd | (0.056) | (0.078)* | (0.098) | (0.057) | (0.067) | (0.074) | (0.121) | (0.162) | (0.154)** | (0.130) | (0.149) | (0.157)* |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **internet** | | | | | | | | | | | | |
| coef | -0.017 | -0.021 | -0.044 | -0.010 | -0.030 | -0.019 | 0.071 | -0.034 | 0.031 | 0.021 | 0.002 | -0.010 |
| sd | (0.023) | (0.026) | (0.026)* | (0.023) | (0.026) | (0.025) | (0.116) | (0.163) | (0.226) | (0.124) | (0.140) | (0.159) |
| obs | 15485 | 15485 | 15485 | 12155 | 9011 | 6492 | 15484 | 15484 | 15484 | 12146 | 9211 | 6648 |
| **# of adm comp** | | | | | | | | | | | | |
| coef | 0.077 | 0.203 | 0.249 | 0.095 | 0.137 | 0.141 | 0.448 | 0.181 | 0.758 | 0.273 | 0.307 | 0.333 |
| sd | (0.068) | (0.078)*** | (0.090)*** | (0.070) | (0.074)* | (0.082)* | (0.275) | (0.399) | (0.362)** | (0.280) | (0.339) | (0.378) |
| obs | 15381 | 15381 | 15381 | 12063 | 8937 | 6433 | 14650 | 14650 | 14650 | 11449 | 8655 | 6237 |
| **# of student comp** | | | | | | | | | | | | |
| coef | -0.058 | 0.069 | 0.724 | -0.069 | 0.006 | 0.369 | 1.586 | 2.413 | 2.941 | 1.640 | 2.011 | 2.433 |
| sd | (0.237) | (0.385) | (0.498) | (0.277) | (0.308) | (0.271) | (0.803)** | (0.976)** | (1.083)*** | (0.822)** | (0.886)** | (0.923)*** |
| obs | 15412 | 15412 | 15412 | 12089 | 8956 | 6445 | 14728 | 14728 | 14728 | 11504 | 8694 | 6258 |

Notes: This table reports TSLS estimates of the effect of 2008 autonomous budget(divided by $10^4$) on 2008´s equipment items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.5: Effect on student performance by municipality education, 2009 (schools with 51-149 students)**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **pass rate, primary** | | | | | | | | | | | | |
| coef | 1.954 | 2.357 | 4.494 | 2.215 | 4.195 | 2.592 | 2.483 | -2.015 | 7.017 | 1.917 | 7.325 | -0.116 |
| sd | (3.125) | (5.315) | (8.728) | (4.872) | (5.760) | (7.419) | (3.309) | (5.079) | (10.043) | (5.289) | (6.788) | (6.482) |
| obs | 8238 | 8238 | 8238 | 3871 | 3072 | 2361 | 8106 | 8106 | 8106 | 4171 | 3350 | 2566 |
| **failure rate, primary** | | | | | | | | | | | | |
| coef | -0.271 | -2.039 | -5.266 | -2.056 | -3.677 | -1.247 | -0.588 | 1.147 | -4.471 | -0.126 | -4.890 | -0.544 |
| sd | (2.344) | (3.873) | (5.754) | (3.494) | (4.007) | (5.084) | (3.023) | (4.931) | (9.007) | (4.810) | (6.249) | (6.117) |
| obs | 8238 | 8238 | 8238 | 3871 | 3072 | 2361 | 8106 | 8106 | 8106 | 4171 | 3350 | 2566 |
| **dropout rate, primary** | | | | | | | | | | | | |
| coef | -1.333 | 0.597 | 2.323 | 1.079 | 0.474 | -0.550 | -1.502 | 0.531 | -3.227 | -1.715 | -2.740 | -0.293 |
| sd | (1.457) | (2.466) | (4.253) | (2.342) | (2.750) | (3.389) | (1.460) | (2.368) | (3.349) | (2.308) | (2.676) | (2.536) |
| obs | 8238 | 8238 | 8238 | 3871 | 3072 | 2361 | 8106 | 8106 | 8106 | 4171 | 3350 | 2566 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s student performance indices. The school sample considered includes schools with 51-149 students in 2007. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.6: Effect on aggregate indices by municipality education, 2009 (schools with 51-149 students)**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Physical Infrastructure Index** | | | | | | | | | | | | |
| coef | -0.037 | 0.048 | 0.051 | 0.005 | 0.078 | 0.067 | 0.041 | -0.064 | -0.123 | -0.065 | -0.018 | -0.174 |
| sd | (0.056) | (0.091) | (0.142) | (0.085) | (0.101) | (0.122) | (0.120) | (0.209) | (0.340) | (0.198) | (0.253) | (0.261) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Equipment Index** | | | | | | | | | | | | |
| coef | 0.188 | 0.198 | 0.020 | 0.165 | 0.118 | 0.083 | 0.132 | 0.100 | 0.089 | 0.013 | 0.102 | 0.163 |
| sd | (0.063)*** | (0.107)* | (0.155) | (0.095)* | (0.106) | (0.123) | (0.107) | (0.172) | (0.279) | (0.159) | (0.216) | (0.217) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s infrastructure aggregate indices. The school sample considered includes schools with 51-149 students in 2007. The sample is divided considering the median of the proportion of literate adults. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, playground. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.7: Effect on physical infrastructure items by municipality education, 2009 (schools with 51-149 students)**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **school building** | | | | | | | | | | | | |
| coef | -0.014 | 0.034 | 0.008 | 0.007 | 0.029 | 0.020 | -0.035 | -0.034 | -0.056 | -0.081 | -0.049 | 0.010 |
| sd | (0.033) | (0.054) | (0.085) | (0.053) | (0.060) | (0.075) | (0.041) | (0.068) | (0.112) | (0.066) | (0.077) | (0.090) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **principal office** | | | | | | | | | | | | |
| coef | -0.173 | -0.027 | 0.082 | -0.026 | 0.107 | 0.033 | -0.080 | 0.093 | 0.052 | -0.000 | 0.079 | 0.069 |
| sd | (0.086)** | (0.140) | (0.214) | (0.136) | (0.172) | (0.178) | (0.098) | (0.171) | (0.266) | (0.146) | (0.172) | (0.205) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **teacher office** | | | | | | | | | | | | |
| coef | -0.061 | 0.022 | -0.135 | -0.059 | -0.052 | 0.053 | 0.064 | -0.092 | 0.118 | 0.100 | 0.023 | -0.038 |
| sd | (0.076) | (0.119) | (0.152) | (0.105) | (0.122) | (0.139) | (0.133) | (0.242) | (0.403) | (0.219) | (0.291) | (0.328) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **computer lab** | | | | | | | | | | | | |
| coef | 0.061 | 0.070 | 0.044 | 0.069 | 0.081 | 0.017 | 0.063 | -0.276 | -0.424 | -0.315 | -0.270 | -0.281 |
| sd | (0.065) | (0.123) | (0.214) | (0.114) | (0.141) | (0.174) | (0.144) | (0.241) | (0.436) | (0.239) | (0.299) | (0.332) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **science lab** | | | | | | | | | | | | |
| coef | -0.022 | 0.008 | 0.040 | 0.007 | 0.019 | 0.037 | 0.071 | 0.074 | -0.080 | 0.078 | 0.002 | -0.090 |
| sd | (0.025) | (0.037) | (0.051) | (0.035) | (0.041) | (0.043) | (0.055) | (0.091) | (0.127) | (0.085) | (0.099) | (0.104) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **sport court** | | | | | | | | | | | | |
| coef | -0.003 | 0.067 | 0.016 | 0.030 | 0.073 | 0.007 | 0.071 | 0.076 | 0.054 | 0.054 | 0.149 | 0.104 |
| sd | (0.050) | (0.077) | (0.120) | (0.076) | (0.088) | (0.099) | (0.097) | (0.181) | (0.319) | (0.167) | (0.215) | (0.247) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **kitchen** | | | | | | | | | | | | |
| coef | -0.004 | 0.008 | 0.037 | -0.020 | 0.002 | 0.055 | -0.013 | -0.038 | 0.141 | -0.014 | 0.094 | 0.022 |
| sd | (0.045) | (0.070) | (0.098) | (0.063) | (0.071) | (0.077) | (0.061) | (0.107) | (0.175) | (0.095) | (0.114) | (0.127) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **library** | | | | | | | | | | | | |
| coef | 0.137 | 0.072 | 0.095 | 0.104 | 0.118 | 0.104 | 0.082 | 0.123 | -0.183 | 0.094 | 0.051 | -0.103 |
| sd | (0.072)* | (0.086) | (0.125) | (0.080) | (0.096) | (0.101) | (0.133) | (0.223) | (0.339) | (0.214) | (0.270) | (0.274) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **playground** | | | | | | | | | | | | |
| coef | -0.008 | -0.007 | -0.008 | 0.007 | 0.002 | -0.048 | -0.076 | 0.039 | 0.133 | -0.057 | 0.006 | 0.060 |
| sd | (0.024) | (0.036) | (0.050) | (0.034) | (0.039) | (0.044) | (0.101) | (0.175) | (0.287) | (0.169) | (0.207) | (0.244) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **classrooms** | | | | | | | | | | | | |
| coef | -0.065 | -0.357 | -0.838 | -0.288 | -0.638 | -0.537 | -0.175 | 0.051 | -0.291 | -0.102 | -0.277 | -1.320 |
| sd | (0.284) | (0.400) | (0.598) | (0.378) | (0.462) | (0.510) | (0.746) | (1.426) | (2.145) | (1.314) | (1.539) | (1.641) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s physical infrastructure items. The school sample considered includes schools with 51-149 students in 2007. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.8: Effect on equipment infrastructure items by municipality education, 2009 (schools with 51-149 students)**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **TV** | | | | | | | | | | | | |
| coef | 0.033 | 0.147 | -0.008 | 0.111 | 0.023 | -0.047 | 0.096 | 0.036 | 0.013 | 0.061 | 0.099 | 0.043 |
| sd | (0.104) | (0.174) | (0.276) | (0.161) | (0.194) | (0.227) | (0.102) | (0.175) | (0.273) | (0.164) | (0.198) | (0.205) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **VHS** | | | | | | | | | | | | |
| coef | 0.100 | 0.050 | 0.136 | 0.120 | 0.120 | 0.073 | 0.070 | 0.074 | -0.113 | 0.085 | 0.023 | -0.001 |
| sd | (0.083) | (0.133) | (0.197) | (0.127) | (0.155) | (0.162) | (0.115) | (0.195) | (0.261) | (0.204) | (0.214) | (0.214) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **DVD player** | | | | | | | | | | | | |
| coef | 0.012 | -0.042 | -0.351 | -0.056 | -0.187 | -0.216 | -0.027 | -0.109 | -0.344 | -0.132 | -0.088 | -0.134 |
| sd | (0.118) | (0.202) | (0.311) | (0.181) | (0.220) | (0.246) | (0.105) | (0.188) | (0.306) | (0.171) | (0.220) | (0.241) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Parabolic antenna** | | | | | | | | | | | | |
| coef | 0.162 | 0.306 | 0.179 | 0.292 | 0.193 | 0.216 | 0.053 | -0.059 | -0.351 | -0.006 | -0.093 | -0.175 |
| sd | (0.079)** | (0.141)** | (0.189) | (0.117)** | (0.127) | (0.149) | (0.142) | (0.252) | (0.418) | (0.241) | (0.316) | (0.363) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Copy machine** | | | | | | | | | | | | |
| coef | 0.059 | -0.041 | -0.126 | -0.045 | -0.013 | -0.113 | 0.279 | 0.139 | 0.055 | 0.103 | 0.128 | 0.224 |
| sd | (0.052) | (0.067) | (0.104) | (0.066) | (0.070) | (0.078) | (0.137)** | (0.228) | (0.345) | (0.216) | (0.251) | (0.296) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Slide projector** | | | | | | | | | | | | |
| coef | 0.024 | -0.030 | -0.135 | -0.022 | -0.106 | -0.087 | 0.065 | 0.138 | 0.096 | 0.067 | 0.119 | 0.128 |
| sd | (0.036) | (0.053) | (0.078)* | (0.052) | (0.059)* | (0.060) | (0.111) | (0.182) | (0.305) | (0.176) | (0.212) | (0.255) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Printing machine** | | | | | | | | | | | | |
| coef | 0.116 | 0.062 | -0.007 | -0.019 | 0.010 | 0.131 | -0.063 | 0.226 | 0.311 | 0.102 | 0.205 | 0.206 |
| sd | (0.083) | (0.107) | (0.131) | (0.109) | (0.112) | (0.120) | (0.110) | (0.163) | (0.243) | (0.164) | (0.191) | (0.186) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **# of computers** | | | | | | | | | | | | |
| coef | 0.140 | 0.347 | 0.956 | 0.245 | 0.756 | 0.691 | -2.085 | -2.295 | -4.405 | -4.199 | -4.136 | -2.995 |
| sd | (0.592) | (0.745) | (0.931) | (0.716) | (0.658) | (0.699) | (1.774) | (2.844) | (4.537) | (2.826) | (3.204) | (3.425) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Having student computers** | | | | | | | | | | | | |
| coef | 0.045 | 0.032 | 0.064 | 0.038 | 0.082 | 0.078 | 0.097 | -0.092 | -0.112 | -0.169 | -0.022 | -0.066 |
| sd | (0.068) | (0.126) | (0.223) | (0.116) | (0.144) | (0.183) | (0.166) | (0.224) | (0.331) | (0.209) | (0.244) | (0.268) |
| obs | 8365 | 8365 | 8365 | 3929 | 3125 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **Having computers** | | | | | | | | | | | | |
| coef | 0.168 | 0.249 | 0.346 | 0.222 | 0.307 | 0.273 | -0.204 | 0.059 | 0.442 | -0.054 | 0.102 | 0.154 |
| sd | (0.081)** | (0.104)** | (0.143)** | (0.098)** | (0.108)*** | (0.121)** | (0.116)* | (0.188) | (0.305) | (0.182) | (0.233) | (0.236) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **internet** | | | | | | | | | | | | |
| coef | 0.142 | 0.078 | 0.081 | 0.088 | 0.089 | 0.032 | 0.134 | 0.029 | 0.027 | 0.019 | -0.059 | 0.106 |
| sd | (0.053)*** | (0.077) | (0.112) | (0.079) | (0.078) | (0.089) | (0.157) | (0.279) | (0.484) | (0.259) | (0.320) | (0.385) |
| obs | 8361 | 8361 | 8361 | 3928 | 3124 | 2402 | 8346 | 8346 | 8346 | 4289 | 3445 | 2636 |
| **# of adm comp** | | | | | | | | | | | | |
| coef | 0.476 | 0.696 | 0.933 | 0.614 | 0.735 | 0.664 | -1.080 | -0.647 | -1.692 | -1.188 | -1.414 | -1.368 |
| sd | (0.146)*** | (0.198)*** | (0.298)*** | (0.197)*** | (0.219)*** | (0.259)** | (0.486)** | (0.831) | (1.468) | (0.784) | (1.036) | (1.201) |
| obs | 7905 | 7905 | 7905 | 3702 | 2936 | 2255 | 7441 | 7441 | 7441 | 3822 | 3067 | 2355 |
| **# of student comp** | | | | | | | | | | | | |
| coef | -0.086 | 0.171 | 0.084 | -0.180 | 0.280 | 0.452 | -0.626 | -0.058 | -3.070 | -2.139 | -1.616 | -1.742 |
| sd | (0.561) | (0.773) | (1.138) | (0.658) | (0.702) | (0.833) | (1.690) | (2.755) | (4.910) | (2.639) | (3.070) | (3.731) |
| obs | 8043 | 8043 | 8043 | 3764 | 2987 | 2293 | 7061 | 7061 | 7061 | 3601 | 2902 | 2231 |

Notes: This table reports TSLS estimates of the effect of 2008-09 autonomous budget (divided by $10^4$) on 2009´s equipment items. The school sample considered includes schools with 51-149 students in 2007. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.9: Effect on student performance by municipality education, 2012**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **pass rate, primary** | | | | | | | | | | | | |
| coef | 0.283 | 0.538 | 11.225 | -0.813 | 1.508 | 4.590 | 1.900 | 2.950 | 8.763 | 1.114 | 5.176 | -2.349 |
| sd | (7.533) | (15.497) | (12.524) | (8.280) | (10.648) | (11.598) | (4.500) | (7.680) | (12.789) | (5.165) | (5.697) | (8.024) |
| obs | 11549 | 11549 | 11549 | 8997 | 6723 | 4768 | 11472 | 11472 | 11472 | 9181 | 6953 | 4993 |
| **failure rate, primary** | | | | | | | | | | | | |
| coef | 3.474 | 12.821 | 0.861 | 7.087 | 7.993 | 6.780 | -4.058 | -1.849 | -0.946 | -3.252 | -3.700 | 1.335 |
| sd | (6.889) | (14.478) | (12.798) | (7.338) | (9.390) | (10.900) | (3.125) | (4.890) | (8.856) | (3.430) | (3.722) | (5.219) |
| obs | 11549 | 11549 | 11549 | 8997 | 6723 | 4768 | 11472 | 11472 | 11472 | 9181 | 6953 | 4993 |
| **dropout rate, primary** | | | | | | | | | | | | |
| coef | -3.661 | -13.066 | -11.362 | -6.265 | -9.356 | -10.860 | 1.914 | -0.729 | -7.307 | 2.138 | -1.346 | 0.898 |
| sd | (2.893) | (4.856)*** | (6.248)* | (3.116)** | (3.949)** | (4.071)*** | (2.476) | (4.162) | (6.303) | (2.853) | (3.080) | (3.899) |
| obs | 11549 | 11549 | 11549 | 8997 | 6723 | 4768 | 11472 | 11472 | 11472 | 9181 | 6953 | 4993 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget(divided by 104) on 2012´s student performance indices. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.10: Effect on aggregate indices by municipality education, 2012**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **Physical Infrastructure Index** | | | | | | | | | | | | |
| coef | -0.081 | 0.200 | -0.027 | 0.056 | -0.027 | 0.055 | 0.139 | -0.156 | -0.626 | 0.082 | 0.075 | -0.164 |
| sd | (0.119) | (0.189) | (0.213) | (0.118) | (0.149) | (0.157) | (0.154) | (0.227) | (0.417) | (0.168) | (0.180) | (0.223) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **Equipment Index** | | | | | | | | | | | | |
| coef | 0.157 | 0.416 | 0.200 | 0.210 | 0.336 | 0.188 | -0.114 | -0.318 | -0.999 | -0.071 | -0.165 | -0.384 |
| sd | (0.230) | (0.392) | (0.504) | (0.259) | (0.328) | (0.365) | (0.174) | (0.312) | (0.383)*** | (0.200) | (0.241) | (0.273) |
| obs | 11542 | 11542 | 11542 | 8970 | 6691 | 4736 | 11594 | 11594 | 11594 | 9295 | 7055 | 5075 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget (divided by 104) on 2012´s infrastructure aggregate indices. The sample is divided considering the median of the proportion of literate adults. Physical Infrastructure Index considers principal office, teacher room, kitchen, computer lab, science lab, sport court, library, kindergaden. Equipment Index take into account having TV, parabolic antenna, copy machine, slide projector, printing machine, computers, student computers, and internet. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.11: Effect on physical infrastructure items by municipality education, 2012**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **school building** | | | | | | | | | | | | |
| coef | 0.160 | 0.213 | 0.288 | 0.265 | 0.216 | 0.281 | -0.364 | 0.032 | 0.528 | -0.363 | -0.303 | -0.177 |
| sd | (0.218) | (0.324) | (0.430) | (0.239) | (0.281) | (0.283) | (0.308) | (0.515) | (0.796) | (0.347) | (0.382) | (0.473) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **principal office** | | | | | | | | | | | | |
| coef | 0.214 | 0.267 | 0.297 | 0.221 | 0.180 | 0.215 | -0.200 | -0.624 | -0.886 | -0.314 | -0.356 | -0.535 |
| sd | (0.178) | (0.295) | (0.321) | (0.193) | (0.239) | (0.258) | (0.161) | (0.218)*** | (0.358)** | (0.171)* | (0.196)* | (0.222)** |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **teacher office** | | | | | | | | | | | | |
| coef | 0.036 | 0.143 | -0.175 | 0.142 | 0.037 | 0.027 | 0.242 | 0.040 | 0.165 | 0.184 | 0.158 | 0.197 |
| sd | (0.113) | (0.162) | (0.180) | (0.125) | (0.141) | (0.149) | (0.177) | (0.292) | (0.419) | (0.199) | (0.225) | (0.283) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **computer lab** | | | | | | | | | | | | |
| coef | -0.156 | -0.194 | 0.004 | -0.136 | -0.223 | -0.154 | -0.154 | -0.035 | -0.631 | 0.003 | -0.060 | -0.157 |
| sd | (0.193) | (0.349) | (0.476) | (0.222) | (0.278) | (0.318) | (0.181) | (0.288) | (0.404) | (0.197) | (0.220) | (0.238) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **science lab** | | | | | | | | | | | | |
| coef | 0.019 | 0.099 | 0.063 | 0.051 | 0.050 | 0.036 | -0.021 | -0.051 | -0.118 | -0.029 | -0.015 | -0.111 |
| sd | (0.033) | (0.066) | (0.094) | (0.037) | (0.045) | (0.056) | (0.047) | (0.063) | (0.097) | (0.051) | (0.056) | (0.061)* |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **sport court** | | | | | | | | | | | | |
| coef | -0.071 | 0.052 | -0.063 | -0.034 | 0.009 | 0.035 | 0.148 | -0.141 | -0.328 | 0.099 | 0.014 | -0.063 |
| sd | (0.069) | (0.123) | (0.166) | (0.070) | (0.089) | (0.105) | (0.174) | (0.321) | (0.519) | (0.194) | (0.230) | (0.294) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **kitchen** | | | | | | | | | | | | |
| coef | -0.086 | 0.172 | 0.117 | -0.002 | -0.027 | 0.112 | -0.233 | -0.204 | -0.537 | -0.218 | -0.233 | -0.226 |
| sd | (0.098) | (0.148) | (0.148) | (0.101) | (0.124) | (0.111) | (0.086)*** | (0.131) | (0.226)** | (0.090)** | (0.098)** | (0.117)* |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **library** | | | | | | | | | | | | |
| coef | -0.077 | -0.122 | -0.328 | -0.046 | -0.092 | -0.151 | 0.093 | -0.050 | -0.080 | 0.015 | 0.094 | 0.009 |
| sd | (0.099) | (0.180) | (0.253) | (0.108) | (0.138) | (0.149) | (0.123) | (0.215) | (0.292) | (0.138) | (0.161) | (0.194) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **playground** | | | | | | | | | | | | |
| coef | -0.069 | -0.030 | -0.016 | -0.064 | -0.068 | -0.046 | 0.362 | 0.483 | 0.462 | 0.365 | 0.429 | 0.422 |
| sd | (0.050) | (0.084) | (0.096) | (0.055) | (0.070) | (0.073) | (0.101)*** | (0.145)*** | (0.243)* | (0.109)*** | (0.112)*** | (0.145)*** |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **classrooms** | | | | | | | | | | | | |
| coef | 0.419 | 0.596 | 0.248 | 0.593 | 0.448 | 0.350 | 4.484 | 8.449 | 8.361 | 4.959 | 6.420 | 7.490 |
| sd | (0.469) | (0.739) | (0.964) | (0.470) | (0.578) | (0.623) | (4.574) | (8.206) | (10.032) | (5.063) | (5.978) | (7.544) |
| obs | 11734 | 11734 | 11734 | 9137 | 6825 | 4840 | 11805 | 11805 | 11805 | 9464 | 7194 | 5174 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget (divided by $10^4$) on 2012´s physical infrastructure items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

**Table A.3.12: Effect on equipment infrastructure items by municipality education, 2012**

| | Lower Municipality Education | | | | | | Higher Municipality Education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) | Linear | Quadratic | Cubic | (25 width around the cutoff point) | (20 width around the cutoff point) | (15 width around the cutoff point) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| **TV** | | | | | | | | | | | | |
| coef | -0.032 | 0.476 | 0.553 | 0.022 | 0.270 | 0.338 | -0.157 | -0.397 | -0.288 | -0.235 | -0.284 | -0.298 |
| sd | (0.223) | (0.294) | (0.339) | (0.235) | (0.264) | (0.267) | (0.162) | (0.306) | (0.475) | (0.181) | (0.214) | (0.274) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **VHS** | | | | | | | | | | | | |
| coef | 0.025 | -0.060 | -0.205 | 0.044 | -0.019 | -0.044 | -0.121 | -0.531 | -1.050 | -0.180 | -0.322 | -0.588 |
| sd | (0.097) | (0.170) | (0.213) | (0.113) | (0.125) | (0.148) | (0.160) | (0.287)* | (0.373)*** | (0.175) | (0.204) | (0.259)** |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **DVD player** | | | | | | | | | | | | |
| coef | 0.071 | 0.709 | 0.609 | 0.231 | 0.368 | 0.393 | -0.025 | -0.013 | 0.142 | -0.089 | -0.020 | 0.098 |
| sd | (0.245) | (0.353)** | (0.382) | (0.259) | (0.318) | (0.339) | (0.151) | (0.250) | (0.373) | (0.163) | (0.188) | (0.226) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **Parabolic antenna** | | | | | | | | | | | | |
| coef | 0.159 | 0.130 | -0.004 | 0.154 | 0.146 | 0.096 | 0.107 | 0.001 | -0.004 | 0.083 | 0.062 | 0.044 |
| sd | (0.137) | (0.291) | (0.373) | (0.162) | (0.202) | (0.240) | (0.149) | (0.277) | (0.399) | (0.169) | (0.193) | (0.251) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **Copy machine** | | | | | | | | | | | | |
| coef | -0.015 | -0.155 | -0.343 | -0.022 | -0.048 | -0.217 | 0.034 | 0.136 | -0.562 | 0.146 | 0.087 | -0.017 |
| sd | (0.121) | (0.205) | (0.316) | (0.134) | (0.164) | (0.183) | (0.161) | (0.279) | (0.354) | (0.182) | (0.221) | (0.255) |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **Slide projector** | | | | | | | | | | | | |
| coef | 0.026 | -0.014 | -0.132 | 0.033 | 0.031 | -0.017 | -0.144 | -0.352 | -0.518 | -0.214 | -0.174 | -0.296 |
| sd | (0.049) | (0.074) | (0.083) | (0.054) | (0.066) | (0.064) | (0.098) | (0.203)* | (0.271)* | (0.111)* | (0.144) | (0.166)* |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **Printing machine** | | | | | | | | | | | | |
| coef | 0.296 | 0.330 | 0.310 | 0.336 | 0.363 | 0.223 | -0.266 | -0.480 | -0.846 | -0.251 | -0.333 | -0.422 |
| sd | (0.246) | (0.433) | (0.620) | (0.272) | (0.352) | (0.385) | (0.162) | (0.277)* | (0.379)** | (0.193) | (0.205) | (0.248)* |
| p-value | 0.228 | 0.445 | 0.617 | 0.218 | 0.302 | 0.563 | 0.101 | 0.083 | 0.026 | 0.193 | 0.104 | 0.088 |
| obs | 11970 | 11970 | 11970 | 9275 | 6908 | 4882 | 11930 | 11930 | 11930 | 9535 | 7240 | 5195 |
| **# of computers** | | | | | | | | | | | | |
| coef | 1.254 | -0.023 | 1.098 | 1.299 | 0.192 | -0.518 | -10.737 | -11.677 | -1.228 | -10.307 | -12.486 | -13.235 |
| sd | (1.591) | (2.822) | (3.984) | (1.800) | (2.270) | (2.496) | (8.824) | (12.119) | (8.929) | (10.233) | (11.907) | (11.763) |
| obs | 11734 | 11734 | 11734 | 9137 | 6825 | 4840 | 11805 | 11805 | 11805 | 9464 | 7194 | 5174 |
| **Having student computers** | | | | | | | | | | | | |
| coef | 0.171 | 0.215 | 0.078 | 0.191 | 0.235 | 0.060 | -0.044 | 0.125 | -0.458 | 0.153 | 0.046 | -0.099 |
| sd | (0.209) | (0.379) | (0.532) | (0.238) | (0.308) | (0.343) | (0.228) | (0.373) | (0.498) | (0.238) | (0.280) | (0.323) |
| obs | 11778 | 11778 | 11778 | 9108 | 6774 | 4778 | 11719 | 11719 | 11719 | 9366 | 7101 | 5096 |
| **Having computers** | | | | | | | | | | | | |
| coef | 0.215 | 0.499 | 0.575 | 0.248 | 0.471 | 0.271 | -0.148 | 0.144 | -0.558 | 0.042 | 0.082 | -0.154 |
| sd | (0.259) | (0.472) | (0.617) | (0.293) | (0.382) | (0.420) | (0.130) | (0.172) | (0.204)*** | (0.120) | (0.132) | (0.130) |
| obs | 11734 | 11734 | 11734 | 9137 | 6825 | 4840 | 11805 | 11805 | 11805 | 9464 | 7194 | 5174 |
| **internet** | | | | | | | | | | | | |
| coef | 0.103 | -0.093 | -0.094 | 0.048 | -0.013 | -0.061 | 0.005 | -0.354 | -0.505 | -0.089 | -0.211 | -0.293 |
| sd | (0.083) | (0.129) | (0.170) | (0.080) | (0.100) | (0.115) | (0.139) | (0.272) | (0.428) | (0.153) | (0.189) | (0.252) |
| obs | 11734 | 11734 | 11734 | 9137 | 6825 | 4840 | 11805 | 11805 | 11805 | 9464 | 7194 | 5174 |
| **# of adm comp** | | | | | | | | | | | | |
| coef | 0.365 | 0.246 | -0.212 | 0.658 | 0.291 | -0.143 | -0.618 | -0.263 | -0.243 | -0.776 | -0.224 | -0.134 |
| sd | (0.449) | (0.751) | (0.867) | (0.507) | (0.628) | (0.667) | (0.474) | (0.752) | (1.167) | (0.552) | (0.559) | (0.701) |
| obs | 9508 | 9508 | 9508 | 7291 | 5372 | 3773 | 9873 | 9873 | 9873 | 7899 | 6016 | 4331 |
| **# of student comp** | | | | | | | | | | | | |
| coef | 0.141 | -0.708 | 0.199 | 0.101 | -0.760 | -1.144 | -0.938 | 1.137 | -4.647 | 1.017 | 0.089 | -0.511 |
| sd | (1.393) | (2.616) | (3.615) | (1.642) | (2.103) | (2.344) | (2.721) | (3.964) | (5.690) | (2.884) | (3.139) | (3.749) |
| obs | 11699 | 11699 | 11699 | 9037 | 6718 | 4736 | 11540 | 11540 | 11540 | 9201 | 6973 | 5000 |

Notes: This table reports TSLS estimates of the effect of 2011-12 autonomous budget(divided by 104) on 2012´s equipment items. The sample is divided considering the median of the proportion of literate adults. Regressions include as controls: regional dummies, urban dummy, state-run dummy and the lagged variable of the dependent variable. *, **, *** indicate significance at 10%, 5% and 1% levels.

# CHAPTER 4
# Conclusion

Decentralization of public services to lower levels of government has been pointed as a solution for inefficiencies in provision. Nonetheless, transference of power to lower levels of administration might not work in every context since local institution quality affects results. Consequently, design and implementation are key determinants of decentralization success. So many variables affect decentralization outcomes that the lack of consensus regarding empirical evidence on decentralization experiences is not surprising.

The situation is not different considering school decentralization reforms. In this study, we focus on a school-based management experience in Brazil, investigating how different local characteristics affect the functioning of this decentralized system. In addition, we explore the consequences of a specific design that fosters community participation in resource management.

This Brazilian program consists of transferring cash from federal government straight to schools. This funding is received by a school council composed of community members who are responsible for resource management. Smaller schools might not have a school committee and local government receive their transfers, but the school (the principal) should decide about the expenditure of these resources.

In the second chapter of this study, we investigate how additional funding is invested by school committee. We find that resources are most likely spent with equipment instead of physical infrastructure. However, the increase on equipment quality is modest and it may not be targeted to directly benefit students (for instance, computers for teachers use). Schools with better educated mothers and more active community experience more significant improvement on equipment quality, especially on attributes that directly affect student welfare (such as computers for students and physical infrastructure).

These findings contribute to our understanding on how parent characteristics affect school decentralization outcomes. Better educated and previously engaged parents are better capable of defending their interests in a

decentralized system. Therefore, students from these communities might benefit more from school-based management. This result is related to the one obtained by Reinikka and Svensson (2004) in Uganda, indicating that better-off communities bargained for higher share of school investment.

Nonetheless, additional locally managed resources had no significant effect on student performance not even in schools for which mothers are better educated or community is more participative.

The third chapter aims to understand the effect of introducing community participation on resource management. We compare two different designs of the same decentralization program: schools with and without a council to manage resources. The introduction of school council management might lead to a more effective use of resources and might also reduce local capture. However, due to program rules, we are able only to estimate the effects of school council management combined with more resources. Results point towards moderate improvement on student performance (measured by dropout, failure and pass rates) and upgrading in equipment infrastructure. An unexpected increase of qualified teachers was also found. Therefore, it seems that parents are not only improving the use of resources but also demanding other changes on school quality.

By comparing these findings with other contexts where there was only an increase in resources, we present some evidence that the previous outcomes are mainly driven by the innovation of school council management. Consequently, community participation on management ensued enhanced school decentralization. This suggests that a design mechanism that empowers community might contribute to better decentralization results.

We also show that the introduction of more community participation on management induces equipment upgrading not only in schools located within more educated municipalities but also in those from less educated municipalities. Nevertheless, improvement on student computers, academic performance and teacher qualification are concentrated in schools with a more qualified local community.

Our findings from both chapters indicate that positive outcomes in school decentralized systems depend on local characteristics. This corroborates other

previous results, such as Hanushek et al. (2011), Galiani et al. (2008), Madeira (2012) and Blimpo and Evans (2011). Better off communities seems to benefit more of decentralized school systems. This poses as a relevant question the investigation of different designs or implementation strategies that neutralize the trade-off between efficiency and equity present in school decentralization reforms.

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