

**MAKING EDUCATION WORK:
SCHOOL AUTONOMY AND PERFORMANCE**

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Abstract

The autonomy of schools is often considered to be improving school performance. However, there is some evidence that there could be conditional factors for such a relationship. This article analyzes the effect of social capital on the relationship between school autonomy and its performance. The study is based upon a new public management approach and uses PISA test data across more than 1,500 schools and multi-level modelling to answer the question. The results suggest that performance of schools is dependent on the level of social capital in the country. Autonomy of schools in countries with more social capital has a positive effect on performance, while autonomy of schools in countries with less social capital brings a negative effect for school performance. The results invite policy-makers for a more customized approach to educational reforms.

Keywords: education, school autonomy, performance, social capital

Introduction

As part of a global phenomenon, many countries have enacted policies to increase autonomy in schools with the overall goal of higher performance. Such a shift towards more autonomy has become mainstream and has even been pushed forward by various international institutions, including the World Bank (SABER 2015; Bonal 2002). However, despite the direction that the educational policies across the world are shifting to, academia points out the ambiguity of the influence of autonomy on school performance and the uncertainty of its outcomes when combined with moderating factors. On the one hand, school autonomy can increase performance by allowing tailoring school policies to the needs of the constituencies the schools are serving and

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increasing efficiency (Fuchs and Woessmann 2004; Galiani et al. 2005), easing decision-making procedures (Patrinos et al. 2009) and facilitating monitoring of the implementation of the decisions within schools (Ahmad et al. 2005). On the other hand, school performance can be brought down in the presence of particular conditions, including increasing transaction costs, opening opportunities for corruption and making accountability difficult (see Galiani et al. [2005] for an example on Argentina). Among such conditions are income inequality (Fertig 2003), low economic development in a country (Hanushek et al. 2013), lack of accountability mechanisms in a school (see OECD [2011] on standardized tests), and a low social capital (Gamarnikow & Green 1999; Pil & Leanna 2006).

Granted, low levels of social capital, taken as interpersonal trust in this article, is largely considered as a factor which undermines performance of any organization (see, for example, Dirks [1999], Colquitt et al. [2007]). Nevertheless, there is to-date no scholarship on the influence of social capital on the relationship between school autonomy and performance. This article fills in this gap and is contributing to the body of literature on the topic by exploring the moderating effect of social capital on school autonomy and performance. While the policy design that gives schools more autonomy is aimed at increasing its performance, human factors, such as level of social capital, may distort the relationship.

The article addresses the research question by using a multi-level modelling technique for the analysis of the data from PISA test (OECD 2015). The analysis uses two levels of analysis – school- and country- levels. The model includes variables on test scores, social capital levels, degree of autonomy and school accountability, average social-economic background of students and controls for ownership type and school area. The results of the study have a direct practical relevance and serve as reference point for educational policy makers. It is especially important in light of the World Bank and alike institutions' policies on education in their beneficiary countries. By initiating a discussion on the role of social capital, this article helps decision-makers create more tailored policies which take into account specificities of the countries they work in. Additionally, the article makes a contribution to a theoretical body of research on school autonomy, extending the empirical scope of the existing studies and including social capital dimension in the discussion.

The notion of autonomy of schools can refer to several concepts; thus, it is important to clarify the matter in a framework of this article. As World Bank reports (SABER 2013), autonomy of schools is a form of management of

schools in which they are provided with the authority to do decision-making in relation to their activities, including, but not limited to, hiring and firing of personnel, management budget, evaluation of teachers and teaching practice. This article considers autonomy in formation of school curriculum and hiring and firing teachers. The choice is dictated by the fact that these two indicators vary in terms of the type of autonomy they capture: one is dedicated to school management and the other – to teaching activities. The variation will allow broader conclusions on the effects of autonomy on performance.

The sample used in the study consists of eight countries from the post-Soviet region¹. Their similarities make it possible to control for many other factors which can affect the performance in schools. The countries in the post-Soviet region have common historical developments and are similar in political, economic and social dimensions. In addition, many countries in the region underwent similar educational reforms to meet the conditions of loans provided by international institutions after the collapse of the Soviet Union (Silova 2009). Educational systems in the countries in the sample are, in fact, rather similar. All countries have at least nine compulsory grades. Generally, after the ninth grade, pupils can choose to continue with upper secondary education or to go for a vocational education track. Most of countries also have a large proportion of schools operating in minority languages, where the prevalent language is Russian, and in most cases education is provided free of charge. These similarities ensure comparability of schools across the sample.

The article will next outline theoretical basis of the study and the hypotheses, followed by a section on methodology, including justification for focusing on the post-Soviet region and the model used in the analysis. The empirical analysis section introduces the results of the multi-level modelling and leads to the conclusion of the article.

Theoretical underpinnings

To understand the role of school autonomy for performance it is important to dig deeper into the New Public Management. The approach rests on several theoretical underpinnings. The New Public Management is closely related to three theories, considered to be the basis for the mechanisms of the effect of autonomy on performance: Public Choice, transaction costs economics and agency theories.

¹ Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Latvia, Moldova, and Russian Federation. Read more about their educational systems in appendix.

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New Public Management

Looking through the lens of the Public Choice theory (Buchanan & Tollison 1984), one could argue that granting schools autonomy is based on the assumption that the principals and other decision-making bodies within a school are rational and will do everything in their power to increase efficiency of the school. Speaking in terms of the autonomy for decisions in curriculum and personnel management, it would imply that autonomy allows schools to choose the best fitting course choices for the student pool and most qualified personnel for attracting more and better students and, thus, receiving more funds. This, in turn, may improve performance. Decisions of the similar kind on the higher level of decision making would not provide the same efficiency, because school administration is on the grassroots level and more aware of the ways to make the curriculum and personnel fit more efficient. Thus, this mechanism is based on the ability of autonomous actors within schools to tailor the curriculum and to choose best fitting teachers for higher efficiency.

Transaction costs economics gives insights into how established relationships between actors can reduce transactions costs – costs related to search for trusted partners, establishing partnerships and for cooperation, as well as ex-post monitoring of the contract enforcement (Tolofari 2005). Following King and Ozler (1998), if one considers schools to be as any other business, then it is possible to see the system of costs which are involved into decision-making processes undergoing in schools. School autonomy decreases the amount of transaction costs involved into decision-making process: schools which have the autonomy can reach agreements internally and externally faster, as the actors on the lower level of administration are more familiar to each other and transaction costs for establishment of the partnerships and reaching agreements are lower. It, in turn, would increase efficiency and school performance by allocating resources to the areas which are most relevant for school performance. Thus, this mechanism is based on the premise of easier decision-making procedures in schools which possess autonomy.

Finally, as for the agency theory, Eisenhardt (1989) describes it as relevant for “employer-employee, lawyer-client, buyer-supplier, and other agency relationships” (p.60). He argues that the relationships are potentially under danger of asymmetry of information. As an implication for the educational sector, principals in schools with more autonomy (being it the principal, parental or teachers’ board or all of the above) would find it easier to monitor the agents and to track whether their decisions are being implemented, and whether the curriculum is being put in place as designed. In terms of personnel management, school autonomy allows choosing the teachers which fit in terms

of the vision of the school operation and development and that may ease the monitoring. Thus, this mechanism is based on the premise of monitoring the agents by the principals.

The literature also widely discusses the effects of autonomy. Generally speaking, New Public Management scholars consider an increase in a degree of autonomy as one of the measures for a more efficient public sector functioning (Tolofari 2005), as it brings public sector closer to the needs of the territory it is governing (Esceland & Filmer 2002). Schools which have obtained autonomy in school management policies demonstrate higher performance; for example, academy schools in the UK achieve higher scores in standardized tests due to different incentives structure to improve the performance comparing to other schools (Welsh & McGinn 1999; Machin & Vernoit 2011). Clark (2009) also suggests that schools which were able to use their funds to attract the best teachers managed to achieve the best test scores. Apart from the impact of teachers, there is also an emphasis on curriculum as playing a role in determining school performance. Hoxby and Rockoff (2004) show that US charter schools, which have autonomy in decisions over curriculum, perform better on average, since they are able to tailor it according to the students' needs. Another study on American schools (Hannaway & Carnoy 1993) also suggests that the schools which were more autonomous due to pressure for inclusion of minorities in decision-making perform better.

Social Capital

Despite the evidence for the positive effect of school autonomy on school performance, there can be other factors that interfere with this relationship. Literature widely points out that social capital, operationalized as interpersonal trust, is an important factor decisive for performance in organizations (see, for example, Gamarnikow and Green [1999]). Putnam et al. (1993), in their classical work on governance in Italy, argue that cooperation and lack of enforced coercion make institutions more efficient. They refer to the transaction costs theory (mentioned above) and argue that bigger social capital - thus, stronger informal institutions - lead to lower transaction costs and, similarly, higher efficiency of the public sector (see also Welzel et al. [2005]).

Social capital may then have an impact on the relationship between school autonomy and performance and on all three mechanisms through which the above mentioned relationship can work. Social capital enhances linkages between people and makes interaction smoother, increasing positive effect of autonomy on performance. It increases information flow and eases communication and solidarity, enhancing the mechanisms outlined earlier. On

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the other hand, societies with low social capital make it difficult for autonomy to work in the predicted direction. Decision-makers of schools in such societies may encounter difficulties with finding reliable information before taking efficiency-motivated decisions. They may also find it harder to come to an agreement with other actors involved in decision-making process and may also experience difficulties with monitoring agents. These conditions require additional efforts and resources spent by the decision-making actors, which, in turn, distract from dedicating those to students. This is expected to decrease the performance and make school autonomy an ineffective measure in societies with low social capital.

The literature provides support for the argument of the importance of social capital for school performance. Pil and Leanna (2006) find that higher levels of social capital bring higher performance of the students because of the frequency and quality of interactions and understanding in the learning process, as well as, particularly, in class discussions. In their study, Pil and Leanna also argue that linkages with external to school actors provide access to key providers of resources. Carbonaro (1998) suggests that social capital, manifested as frequent interaction between students' parents increases the information flow and makes it easier to monitor children.

Also, parents get the ability to judge upon the values which could be transferred from their child's friend' parents to their own child, and "filter" the unwanted people. Similarly, better information flow between parents and school administration provides better fitting school policies when the school is given autonomy, thus increasing school achievements in standardized tests (Sun 1998). Social capital also increases trustworthiness and solidarity (Hao & Bonstead-Bruns 1998), which, in turn, make decision-making process easier and increase levels of compliance, leading to higher efficiency of school and better performance. Higher level of social capital also improves climate in school, which Ho (2005) argues contributes to school performance. Although the literature is rich in discussing effects of school autonomy and social capital on school performance, however, no study was dedicated to investigating the interplay of the social capital, operationalized here as interpersonal trust, and the relationship between the school autonomy and its performance. This study is aimed at covering the gap and investigating this matter.

These theoretical underpinnings help us derive and further test the hypotheses. The hypotheses are that (H1) social capital levels have a significant moderating effect on the relationship between school autonomy and performance; (H2) schools in countries with higher social capitals which enjoy

higher autonomy perform better and (H3) schools in countries with lower social capital which enjoy higher autonomy perform worse.

Methodology

Below is the model which is going to be used for the analysis, where (I) is school level and (II) is state level variables.

$$\begin{aligned} \text{school performance(I)} = & \beta_1 * \text{school autonomy (I)} + \beta_2 * \text{social capital (II)} + \\ & \beta_3 * \text{school autonomy} * \text{social capital} + \beta_3 * \text{school external accountability (I)} + \\ & \beta_4 * \text{average socio-economic status of families in school (I)} + \beta_5 * \text{average} \\ & \text{education of parents in school (I)} + \beta_6 * \text{rural/urban location (I)} + \beta_7 * \text{school} \\ & \text{ownership (I)} + \beta_8 * \text{country economic development (II)} \end{aligned}$$

The dependent variable is school performance. It is a school-level variable, which is operationalized as an average student test scores for schools for math classes. The choice of using math scores was made because it, along with reading, is a major subject in all of the school curricula. However, math scores provide more advantages over reading scores due to the linguistic issue present in the schools in the region. As was mentioned in the introduction, there are a lot of minority schools in the region, which operate in a language different from the national language, which could result in inconsistent results across and within the countries. This variable originally exists only on the individual student level in the dataset, thus individual values were combined into averages per school for the analysis.

The main independent variable is autonomy of a school. The variable is operationalized in two ways: as autonomy in decisions related to forming curriculum and autonomy in decisions on hiring teachers, because these indicators provide highest variance in the type of decisions delegated to the school. Such choice covers both what students are taught and what kind of personnel teaches them. The indicators are based on the answers to the questionnaires given out to the principals of schools participating in PISA. Each of the variables is recoded as a dummy (“0”- responsibility solely lies on the shoulders of municipal, regional or national authorities, “1” – responsibility solely belongs to an actor within a school, be it principal, teachers or board of parents).

Another important independent variable is the level of social capital in a country. There is a lot of controversy in the literature on how to operationalize the concept of social capital. Bjornskov (2006) criticizes the use of indices which combine all three elements proposed by Putnam (1993), being trust,

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norms and networks, as he argues that those describe distinct features of societies and combination of those do not lead to meaningful indices. He comes to a conclusion that social trust alone serves as a driver for good governance in societies. Newton (2001) also argues that social trust is the most important element in the definition of social capital. Van Deth (2003), in turn, through meta-analysis reports that social trust is among the most common ways to measure social capital (see also Knack [2002] and de Mello [2004]). Thus, for the purpose of this article, social trust is used to narrow down the concept of social capital. It is operationalized using variable from World Value, wave 6 (2015) and European Value Surveys, wave 4 (2015): “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”. The answers were recoded as “1”- most people can be trusted, “0” - need to be very careful.

There is also a number of control variables. First, as was pointed out by the literature mentioned in the introduction, it is important to take into consideration how accountable the school is to external authorities. PISA dataset contains a question on presence of standardized tests as a measure of student assessment. It is coded as a dummy, where “0”- no standardized tests present in the school and “1”- school uses standardized tests for student assessment. Another control variable is an average socio-economic background of the students in the sample. One could argue that wealthier schools may perform better merely due to the fact that they have more resources both in school and at students’ homes, or that students from poorer families are forced to choose schools with lower quality (Currie & Thomas [1998]), instead of being affected by autonomous school policies. Controlling for this will allow teasing out the effect of autonomy. The variable is continuous and is operationalized by averaging student-level answers from student questionnaire (“How many computers do you have at home?”) per school as a proxy for socio-economic background. A variable on average educational level of parents in school is also included, because it may determine average student achievements in a school (discussed in Bauer & Riphahn [2006]). It is an ordinal variable and operationalized from 1 to 6, corresponding to the OECD recognized levels of education. Another socio-economic variable used is GDP per capita to account for a country-level wealth of schools, as it is viewed as a potential determinant for schools’ performance (Hanushek et al. 2013). Finally, variables on rural or urban location, which also reflect socio-economic and demographic variance (see a discussion by Cartwright & Allen (2002) (where “1”- the school is located in a city, “0”- in a rural area) and public or private ownership of the school, potential effect of which is discussed by Vandenberghe & Robin (2004) (where “1”- the school is

private, “o”- public) are also accounted for.

To address the above mentioned research question it is possible to use the data from Program for International Student Assessment (PISA) test (PISA 2015). This large dataset includes extensive information both on student and school levels of analysis, contents not only information on performance but also various socioeconomic indicators necessary for controlling the results. The test is conducted across more than 60 countries among the 15 year-olds. The test is conducted in three subjects: reading, math and science (PISA 2015). PISA is largely used in the literature on school performance; however, it has various limitations. The major one relevant for this study is that because PISA is held across eight countries, there may be a danger that the translations of the test questions do not mean the same across the languages of the test conducted everywhere, and measured concepts can be different across different contexts (Mazzio & van Davier 2008).

Multi-level modelling used for the analysis of hierarchical data in this study allows taking into account the variance among the different groups. Interaction effect has been included for accounting the interplay and conditioning of the effect of social capital in the country on relationship between school autonomy and performance. Multi-level modelling allows providing a test for such cross-level interaction effect (Western 1998; Steenbergen & Bradford 2002).

School autonomy across the world and in the Post-Soviet region

Although this study focuses on a sample of Post-Soviet states, school autonomy is not a new idea from a Post-Soviet era and existed around the world for decades. For example, after Franco's death Spain granted more responsibilities to schools (Fiske 1996), while on the other side of the world, in Brazil, the shift towards more school autonomy took place during 90-s to increase education attainment rates (Derqui 2001). Attempting to reach more efficiency, Zimbabwe has also granted more autonomy to schools (Fiske 1996; Chikoko 2006). The shift towards more autonomy has also taken place in the post-Soviet countries which have experienced both political and economic transition in the 90s. It also got reflected into the transformation of the education systems in the region and mirrors the trends towards more school autonomy which could be observed in other parts of the world. After the collapse of the Soviet Union, the governments went for a number of structural changes and shared authority in decision making with lower levels of administration (Eklof et al. 2004). The shift for granting more autonomy to schools was pursued for both political and economic reasons. Zajda (2003)

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argues that in order to decrease the pressure on national budgets, the governments have spread the responsibilities over education policies and budget formulation across the regional authorities and further down the administrative ladder. Zajda (2007, p.202) suggests autonomy in education can be seen as a shift towards “greater efficiency in cost saving, global competitiveness, technological supremacy, social change and accountability”.

Thus, one of the reasons for granting schools more autonomy is the idea that existing school structures are not flexible enough for fitting the needs of students and their parents. He argues that in Eastern Europe, as well as in other developing countries, there has been a trend towards decentralization in education sector due to more democratic and accountable practices, assumed by autonomy, more responsiveness to the local needs and boosting amount of funds available to a school by introducing competition in the sector (p.8). Thus, autonomy in schools is spread all over the world where the measures were undertaken for various reasons, but, however, were generally considered as increasing transparency, accountability and participation of important stakeholders in school management. The process has come to the post-Soviet region considerably later, however, followed the same path as in other parts of the globe.

Empirical Analysis

Below descriptive statistics is presented in Table 1. It shows that the average level of education of the students’ parents in schools is equal to a value of 5,1, which corresponds to ISCED 5B educational program². Also, countries in the sample demonstrate below OECD average performance in math (the mean is 421.14). Average number of computers belonging to students in schools in the sample own is below 1 and most of the schools in the sample are from small towns or villages and the vast majority is public schools. Descriptive statistics also show that the countries in the sample range significantly in terms of GDP per capita (the minimum is 570,30\$, the maximum is 8573,00\$). Most of the schools in the sample are autonomous in matters related to hiring of teachers (mean is equal to 0,82), and have considerable autonomy in relation to decisions on curriculum in school (mean is 0.58).

² “[Such] programmes are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level” (OECD, 2015).

Table 1: Descriptive statistics

	Minimum	Maximum	Mean	Std. dev	N
Math Score	203.58	669.41	421.14	68.16	1448
Hiring Autonomy	0.00	1.00	0.82	0.38	1448
Curriculum Autonomy	0.00	1.00	0.58	0.49	1448
Trust	29.10	41.70	0.3	0.09	1448
Standardized Tests	0.00	1.00	0.92	0.28	1448
Number Computers	1.00	4.00	1.67	0.6	1448
Parents' Education	2.91	6.00	5.1	0.49	1448
City School	0.00	1.00	0.43	0.5	1448
Private School	0.00	1.00	0.03	0.16	1448
GDP	570.30	8573.00	4162.64	2810.71	1448

Note: Values after removal of missing values. The indicated mean value for highest level of parents' education is a median as the variable is ordinal.

There is moderate correlation ($r=-0.56$, $p<0.05$) between GDP per capita and an average number of computers, as both are controls for social-economic factors. Such relationship between the variables will be taken into account at the stage of modelling the data by removing correlated variables and observing whether coefficients change.

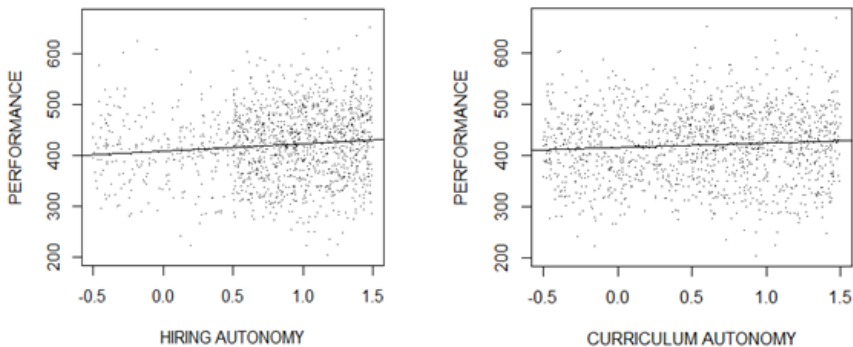
Figure 1: School performance vs. school autonomy

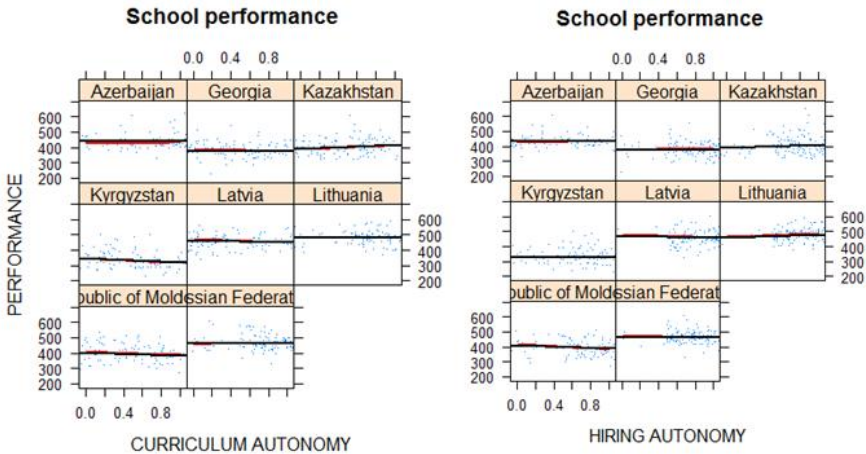
Figure 1 illustrates the distribution of cases along the dimensions of math test scores and school autonomy, operationalized as dummies for hiring and

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curriculum autonomy. It shows that when pooled, there is a sign of a positive relationship between the two variables. Thus, it is possible to suggest that autonomy on average may have a positive effect on school performance in schools in a post-Soviet region. However, when divided by country, the picture changes.

Figure 2 below indicates mixed evidence for the relationship between school autonomy and performance in post-Soviet countries. In particular, Figure 2 shows that the correlation between the two variables becomes less evident once separated by country and for some countries (Moldova, for example) the relationship may be negative. These plots, however, do not take into account control variables, and the variable on social capital, which is the focus of this study. Thus, further investigation is required for drawing conclusions.

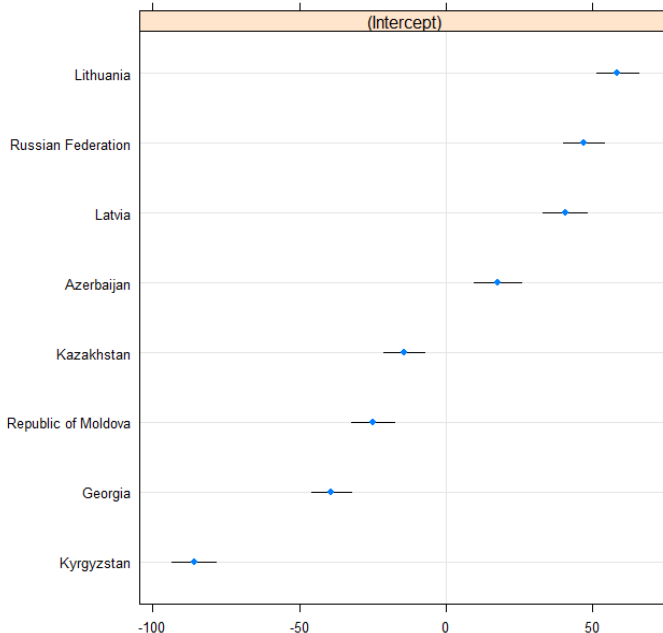
Figure 2: School performance vs. school autonomy by country



It is worth noting that there is a variation in autonomy in schools within countries. In general, this variation is unusual as national policy is expected to define the autonomy level in schools, making the sample of schools within each country more homogeneous. There are, however, several explanations for this variation. The first possible explanation is that principals who fill-in PISA questionnaires interpret the questions in different ways, and autonomy in decisions may refer to a school's discretion to make a choice among possible options set by a higher authority or to an actual right to make their own decision (Maslowski et al. 2007; Orazem et al. 2004). The variance can also be explained by informal institutions, which are a common phenomenon in the region (Welter & Smallbone 2011). The informal relations between school

principals and, for example, municipal authorities can define how much authority is given to the principal, despite the national policy. Finally, the variance can be explained by the fact that in some countries there are specific types of schools which have more autonomy than others. For example, in Russia, since 2006 a school can become autonomous if it wants to upon authorization by a municipality (Gosudarstvennaya Duma 2006). Unfortunately, the data set does not include indicators for controlling this, the analysis will be done using data which has such variation within countries.

Figure 3. Intercepts per country



The plots for bivariate relationships demonstrate that there is a small variance across the countries in the sample for several variables, such as average level of parents' education per school, for example. It suggested testing whether random slopes are needed for those variables. Inclusion of several of them and comparison of the change in Log-Likelihood showed that inclusion of random effects for pupils' socio-economic background and parents' education provide the best fitting model³. On the other hand, random intercept was also included for several reasons. First, Figure 3 indicates a plot for random intercept model,

³ Log-Likelihood is -7484.188 comparing to fixed effect model -7530.714 for hiring autonomy, and -7481.352 comparing to -7527.6 for curriculum autonomy

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which shows that there are differences in intercepts across the countries in the sample, which gives a hint that there should be random intercept included into the model. Second, during the analysis ANOVA test was run to test whether inclusion of random intercept adds up to the explanatory power of the model, and it was significant both statistically and substantially. Finally, and most importantly, intraclass correlation coefficient is equal to 0.49, which suggests that 49% of variance in school performance can be explained by belonging to a particular country.⁴ This is a very high number, which shows that the schools in the same countries are very much similar to each other in terms of the test scores. It can be explained by the fact that schools are strongly embedded within the same educational systems, and could be influenced by country-specific economic realities. This also provides support for the choice of the statistical method⁵.

The comparison between tables 2 and 3 demonstrates that there is no significant difference between results for multi-level models with school autonomy in personnel management and curriculum. For both tables, models V which include random slopes provide the best fit, Log-Likelihoods are the lowest for those models. Analysing the results one can conclude that on average higher parents' education in school predicts higher average test score in math subject per school. This result is both statistically and substantially significant. Also schools in which student pool has a better socio-economic background perform on average worse ($\beta \approx -35$, $p < 0.05$). Inclusion of variable on presence of standardized tests did not show the results which were identified in the academic literature, the indicator was neither substantially nor statistically significant, and school autonomy indicators did not change their coefficients after the inclusion of the variable. Finally, the results also show that schools which are located in cities or towns perform better on math test, as well as do private schools. As for the country-level variables, the analysis shows that the countries with a higher GDP per capita have their schools performing on average slightly better ($\beta = 0.01$, $p < 0.05$). Having in mind the results of the correlation analysis between independent variables, it was decided to remove correlated variables one after another from the model. Nevertheless, after removal of a variable GDP, other estimators and their

⁴ The random effects show that there is significant variation between countries. Overall, social-economic background of students per school and average parents' education vary from positive to negative across the sample which also provide support for the choice of inclusion of random slopes into the model.

⁵ More about intra-class correlation and multi-level modelling is available in Steenbergen and Bradford (2002).

statistical significance remained the same. Thus, since the variable is necessary theoretically, it was left in the model.

For almost all models, school autonomy has a small negative effect on school performance. Nevertheless, once the model on hiring autonomy includes random slopes, the coefficient for school autonomy becomes positive (see Table 2). It was decided to do a robustness check to clarify this ambiguity, and school autonomy was also operationalized as a sum of dummies for all dimensions in PISA questionnaire: “responsibility of student admission”, “responsibility of hiring teachers”, “responsibility of textbook use”, “responsibility of course content” and “responsibility of courses offered”. The scale was used as another way of operationalization of the school autonomy variable. The results of the analysis show that all coefficients keep approximately the same values and school autonomy remains its negative sign, though it is still statistically insignificant ($p=0.22$). Thus, it is possible to conclude that there may be an evidence that school autonomy may have a slight negative effect on school performance in post-Soviet region, however, since the result is not statistically significant, for making stronger conclusions more research needs to be done. Possible negative effect can be referred to underdeveloped institutes in the country and lack of strong culture of accountability and transparency, as suggested by Galiani et al. (2008). As was mentioned previously, they argued that giving more autonomy to schools may be harmful in countries where there are big chances and possibilities for opportunistic behaviour, cronyism and corruption.

The tables also differ in coefficients for the interaction between school autonomy and social capital. Both coefficients are positive, however, only interaction term for curriculum autonomy is statistically significant ($\beta=53.03$, $p<0.05$). For a robust check, a scale of dummies on different dimensions of autonomy mentioned above was again used for running the model. The results demonstrate that, interaction effect is both statistically and substantially significant in predicting math scores ($\beta=19.15$, $p<0.05$) when using the scale variable on school autonomy. Thus, the interaction effect between social capital and school autonomy may be important not only in the case of responsibilities for curriculum design, but for other forms of autonomy as well. This provides support for hypothesis H1.

The coefficient of the interaction term shows the difference in coefficients for curriculum autonomy between two countries which differ by one point in social

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capital. Having in mind that the variables were grand-mean centred, the interpretation goes as following (Hayes 2006). For the schools in countries which are one point of social capital higher than the average, the coefficient for curriculum autonomy is equal to $-0.06 + (53.03) = 52,97$. On the other hand, for the schools in countries which are one point of social capital below the average, the coefficient for curriculum autonomy is equal to $-0.06 - (53.03) = -53.09$. Thus, substantially, the effect of school autonomy on performance is positive in countries with more social capital, while in countries with lower social capital autonomous schools may be disadvantaged, as school autonomy has a negative effect on performance in those countries. This provides support for the hypotheses H2 and H3 of this study and underlines importance of social capital for specific type of school autonomy.

Tables 2 and 3 also present results for a pooled OLS regression model. As was previously observed with plots, when the observations are pooled together, the relationship between curriculum autonomy and performance appears to be positive and statistically significant, while hiring autonomy is negatively correlated with school performance. Presence of standardized test for a model on curriculum autonomy also turns to be positive, although remains statistically insignificant. Interaction effect turns out to be negative for pooled regression model for hiring autonomy. Nevertheless, using OLS model violates the assumption of errors independence, and as intra-class correlation coefficient demonstrated, observations within groups are inter-related, thus, OLS is not an appropriate measure.

Table 2: Regression analysis results for math scores, hiring school autonomy

Variable	MLM					OLS
	I (hiring)	II (hiring)	III (hiring)	IV (hiring)	V (hiring)	VI (hiring)
<i>Fixed effects</i>						
Intercept	360.47*** (16.61)	468.65*** (16.37)	422.04*** (21.1)	422.47*** (21.06)	407.52*** (17.55)	416.61*** (7.77)
School autonomy	-1.68 (3.84)	-0.44 (3.39)	-0.78 (3.4)	-0.93 (4.01)	0.02 (3.3)	-18.58*** (3.6)
Parents' education		26.18*** (2.96)	26.31*** (2.97)	26.25*** (2.97)	29.93*** (9.16)	19.27*** (3.13)
Computers		-30.48*** (2.97)	-30.04*** (2.94)	-30.03*** (2.93)	-34.56*** (6.86)	-24.03*** (3.10)
GDP	0.01*** (0.00)		0.01** (0.00)	0.01** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Social capital	-36.92 (97.34)		-8.12 (118.2)	-22.72 (121.03)	-15.23 (60.81)	26.05 (26.05)
Standardized test	6.26 (4.81)		-0.54 (4.25)	-0.53 (4.25)	-0.50 (4.13)	-1.1 (4.67)
City school		7.46*** (2.68)	7.52*** (2.68)	7.39*** (2.69)	7.39*** (2.65)	14.17*** (2.95)

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Private school		23.27*** (7.34)	23.48*** (7.34)	23.34*** (7.34)	28.73*** (7.12)	22.21** (8.07)
School autonomy: Social capital				22.50 (28.52)	8.82 (27.8)	-108.28*** (29.95)
<i>Random effects</i>						
Intercept	26.04 (2931)	43.14 (1861)	31.73 (1007)	31.66 (1003)	38.38 (1473.2)	
Residual	50.14 (2514)	44.14 (1948)	44.15 (1950)	44.16 (1950)	42.43 (1800.3)	
Computers					17.14 (293.7)	
Parents' education					24.32 (591.6)	
Log-Likelihood	-7727.91	-7541.89	-7535.295	-7530.714	-7484.188	R ² = 0.48
N groups	8					
N observations	1448					

Note: the values are parameter estimates and standard errors in parentheses for fixed effects. The values for random effects are standard deviations and variance in parentheses. *p<0.1, **p<0.05, ***p<0.01.

Table 3: Regression analysis results for math scores, curriculum school autonomy

Variable	MLM					OLS
	I (curriculum)	II (curriculum)	III (curriculum)	IV (curriculum)	V (curriculum)	VI (curriculum)
<i>Fixed effects</i>						
Intercept	361.34*** (16.75)	468.9*** (16.27)	422.10*** (21.14)	421.49*** (21.06)	408.35*** (17)	403.77*** (7.68)
School autonomy	-3.93 (2.8)	-1.12 (2.47)	-1.16 (2.47)	-1.11 (2.47)	-0.06 (2.38)	1.71 (2.68)
Parents' education		26.15*** (2.97)	26.27*** (2.97)	26.56*** (2.97)	30.25*** (9.09)	17.3*** (3.15)
Computers		-30.46*** (2.92)	-30.03*** (2.97)	-29.9*** (2.93)	-34.39*** (6.68)	-23.87*** (3.12)
GDP	0.01*** (0.00)		0.01** (0.00)	0.01** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Social capital	-33.76 (98.93)		-6.91 (118.73)	-45.57 (119.06)	-43.71 (60.67)	-75.69*** (22.44)
Standardized test	6.4 (4.8)		-0.47 (4.25)	-0.22 (4.24)	-0.28 (4.12)	0.77 (4.73)
City school		7.43*** (2.68)	7.48*** (2.69)	7.19*** (2.68)	7.18*** (2.65)	13.66*** (2.99)

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Private school		23.34*** (7.33)	23.51*** (7.33)	23.96*** (7.32)	29.06*** (7.1)	19.82** (8.15)
School autonomy: Social capital				69.02*** (25.04)	53.03** (24.27)	81.29*** (28.16)
<i>Random effects</i>						
Intercept	26.49 (701.6)	43.21 (1867)	31.89 (1017)	31.75 (1008)	36.41 (1326)	
Residual	50.11 (2511)	44.14 (1948)	44.15 (1949)	44.05 (1940)	42.36 (1794.7)	
Computers					16.56 (274.4)	
Parents' education					24.11 (581.3)	
Log-Likelihood	-7727.332	-7542.114	-7535.529	-7527.6	-7481.352	R ² =0.47
N groups	8					
N observations	1448					

Note: the values are parameter estimates and standard errors in parentheses for fixed effects. The values for random effects are standard deviations and variance in parentheses. *p<0.1, **p<0.05, ***p<0.01

Conclusions

The New Public Management approach, which had become popular in XX century all over the world, pushed governments towards granting more autonomy to institutions in the educational sector. It was and is widely believed that giving more autonomy to schools increases their performance. However, literature also gives pointers for conditional factors which can change the relationship between school autonomy and performance.

The study showed that social capital is an important conditional factor for the relationship between autonomy and school performance. The mechanisms of how social capital moderates the effect of school autonomy on performance shall further be tested; however, academic literature suggests that, generally speaking, social capital is advantageous for the school performance in several ways. Social capital assists the information flow, intensifies linkages between actors and smooths the interaction between individuals for effective tailoring of curriculum and choice of fitting personnel in schools, enhances the decision-making process and eases monitoring of agents by principal.

The study has several limitations, and the results must therefore be taken with caution. The main limitation is that the analysis was based on the data on school autonomy received from the principals, who may have different interpretations of both wording of the questions asked and of their own power for decision-making. Thus, the indicators that were obtained this way may be biased. Also, as was described in the methodology chapter, the social capital concept is operationalized through an indicator on social trust, which, although a common way to operationalize the concept, nevertheless captures it only partially. The results, finally, may be difficult to infer to other countries as the sample used in the study includes similar countries which have a lot of common historic, social and political features.

The results of this study have several theoretical implications. First, the study demonstrated that the post-Soviet region countries do not fit into the New Public Management approach. The analysis suggested that educational institutions in the region may not benefit from greater autonomy, thus signifying that the theory is not applicable everywhere. In this way, the study gives a hint that there may be a contradiction with a majority of studies in the field (for example, discussed in Chapter 2 Hoxby and Rockoff [2004]; Zajda [2006]). Second, and conversely, the analysis provides support to a body of literature which states that there are moderating factors for the relationship between school autonomy and school performance (for example, Hanushek et al. [2013]; Galiani et al. [2005]). As mentioned in the introduction, Galiani et al.

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(2005) argue school autonomy may play a negative role in the educational performance in countries with weak institutions and underdeveloped cultures of accountability. The results of this study may be evidence for such conclusions. Additionally, the article contradicts the results of the role of standardized tests for school performance. Despite the common evidence for its positive role, schools in the post-Soviet region do not experience either a positive or negative effect of the presence of such tests on math test scores. Most importantly, this study brings New Public Management and Social Capital theories together, which has not been done before. It brings another dimension of human interactions into the school autonomy-performance relationship, and shows that the level of trust between people matters and can affect the outcome of the designed policies.

This study may also be useful for the policy-makers in the countries included in the analysis. The main conclusion which can be drawn from the results of this study is that granting autonomy may not be the best idea for the educational systems in the countries in post-Soviet region which are characterized by low social capital. Policy-wise, the shift towards granting greater autonomy in the region may need to be delayed until the point when social capital grows in the country and more policy efforts need to be put for generating social capital. Also, the results of the study suggest that school autonomy policies are beneficial in the countries with more social capital. In fact, more social capital brings a large positive effect for school performance.

The study had added both to the theoretical body of research and provided insights for policy-action. However, there remains further research to be conducted in this subject. Particularly, it must be noted that the study can and should be further expanded to a larger sample of countries for more definitive conclusions on the role of social capital for school autonomy and performance. Also, further research could focus more on the accountability and the institutional development, as another possible driver of autonomy and performance in schools, as well as on the mechanisms of the effect of social capital on the relationship between school autonomy and performance.

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Appendix 1: Educational systems in selected post-Soviet countries

1. Latvia

The country was faced with a rapid change in the economy after the Fall of the Soviet Union. In Latvian educational system there are 11 compulsory years: two are on pre-school level and 9 years are in secondary school. The 15 years-olds which were tested for PISA score are in the part of educational system which is compulsory. Another important feature of Latvian educational system is the presence of minority schools. Russian language is a language of instruction in most of such schools (there are also other minority languages: Polish, Hebrew, Belarusian, Ukrainian, Estonian, and Lithuanian (Eurydice 2015) and for a long time they have had an equal footing among other schools. However, as the Council of Europe reports, “Latvian is currently being introduced as the main teaching language in secondary schools“(Council of Europe 2008: 42), thus, several subjects have to be taught in Latvian, regardless whether this is a minority school or not.

2. Lithuania

The educational system is similar to the one in Latvia. Compulsory education in Lithuania is until the pupils reach the age of 16 years old. The education on this level is free of charge (Eurydice 2015). Although educational policy development and implementation are under jurisdiction of the Ministry of Education in Lithuania, “Lithuanian education system is decentralized. The state’s and municipalities’ institutions participate in the education process, the schools and other education institutions have a possibility to take decisions on its management, education content and means.” (Ministry of Education and Science of the Republic of Lithuania 2004). Second prevalent language of instruction is Russian (in 2003, 30 465 of learners chose Russian as a language of instruction as opposed to Lithuanian - 505 086).

3. Moldova

In Moldova compulsory education is until 15 years old. At this age, the students are expected to write a Baccalaureate exam, after which they can choose to either continue education in lyceum, “which provides students with the basic theoretical knowledge and a broad general cultural background needed to continue their studies at the higher educational level or in technical and vocational education institutions or in an institution of general secondary education (UNESCO 2010).

4. Russian Federation

Only 9 years of education are compulsory in Russia: primary and lower secondary education. The 15 year-olds completing the PISA score fall into this category. “By 2003 85% of all public and private establishments of secondary education had received a state license allowing them to charge fees for their activities” (Nordic Recognition Network 2005). There is a recently introduced nation-wide state exam at the end of lower secondary education level.

5. Georgia

According to the 1997 Law on Education, primary education (grades 1-6) is compulsory, while other levels of secondary education are provided free of charge (UNESCO 2010). According to UNESCO, additionally, since 2005 any citizen of Georgia whose native language is not Georgian is entitled to receive education in their language. The most prevalent minority languages are Russian, Armenian and Azerbaijani. According to the statistics of UNESCO, “in 2007 there were 2284 public and 257 private general education schools in the country” (UNESCO 2010). Since only six grades are compulsory, the pupils who participated in the PISA test are those who have chosen to continue education by choice.

6. Azerbaijan

Secondary education (grades 1-11) is provided for free and is obligatory. Ministry of Education is responsible for development of education policies. There is also nation-level commission responsible for the admission of students to specialized secondary schools. Students in 9th grade (15 years old) sit an examination, according to UNESCO: “At the end of grade 9, students had to sit three examinations, two set up by Ministry of Education and one by the class teacher” (UNESCO 2010).

7. Kazakhstan

According to the new reform on education, compulsory education has been increased up to 12 years. “While compulsory education is free by law, in practice parents and communities often bare a portion of the cost of schooling, through textbooks, supplies, school fees, school meals and, in some cases, school maintenance” (UNICEF 2009). On the local level there are departments of education which are responsible for the execution of the national strategy. After completion of basic secondary education, after the 9th grade, pupils receive an examination certificate. After completion of that, they can choose to continue their education in vocational education institution. According to the UNESCO statistics, in 2004 74% of schools were located in rural areas. There are

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several languages of instruction in Kazakhstan: Kazakh, Russian, Uighur, Uzbek and Tajik.

8. Kyrgyzstan

The compulsory education in Kyrgyzstan is 9 grades. It is provided free of charge, as well as the following two years of studies. After completion of compulsory part of secondary education pupils can choose to follow a vocational track. Vast majority of the schools are rural, for example, in 2004 rural schools counted to 1694 schools against 351 urban ones. The most prevalent minority languages which the schools taught in 2004 were Russian, Uzbek and Tajik (UNESCO 2010).