Equal access to education: An Evaluation of the Roma Teaching Assistant Programme in Serbia*

Marianna Battaglia† and Lara Lebedinski‡

This Version: May 25, 2011

Abstract

The paper investigates the impact of the Roma Teaching Assistant Programme in Serbia in its first year of introduction on the following schooling outcomes: marks, absences and probability to dropout. We use two different identification strategies. First, we use a difference-in-difference approach and exploit the gradual implementation and the intensity of the programme to estimate its impact. Second, we compare children exposed to the programme with older cohorts not exposed to the programme. We find that marks have improved, especially for migrants, and dropout have reduced. There is also evidence that children exposed to the programme went on average more to school. Higher and more systematic impacts are obtained in schools with a lower number of Roma. We confirm the robustness of our results with placebo tests for the years prior to the introduction of the programme.

Keywords: programme evaluation, primary education, Roma

JEL classification codes: I21, J13, D04

*We would like to thank Eliana La Ferrara and Andreas Madestam. We are grateful to the personnel of the Minsitry of Education for giving us the authorisation for this project and for answering all our questions. All opinions expressed are of the authors. All errors are our own.

†Phd Candidate, Economics Department, Bocconi University. Email: marianna.battaglia@phd.unibocconi.it

‡Phd Candidate, Economics Department, Bocconi University. Email: lara.lebedinski@phd.unibocconi.it

1 Introduction

Roma are mainly located in South Eastern Europe and with a population of approximately 6 million they constitute a large ethnic minority in Europe[1] (Open Society Institute, 2008). In all countries they suffer severe social exclusion which can be observed by high poverty levels, high unemployment levels, low educational attainment and no participation in the political and cultural life. Roma are poorer than other population groups and more likely to fall into poverty and remain poor. They have persistent disadvantages in education, including low school attendance and overrepresentation in special schools and schools for adult education[2], which limit future opportunities; significantly lower family permanent incomes, also due to greater household size and lower incidence of home ownership, and lower wages, given the overrepresentation among low skilled jobs. They often lack access to credit and property ownership and are overdependent on social benefits.

Lately Roma have consistently attracted media attention, especially in European Union. The visa liberalisation and the adhesion to the Union of countries like Romania and Bulgaria, in which the percentage of Roma population is high, have indirectly led to consistent migration flows towards the western countries. Appearance of informal settlements, increased number of unemployed and inadequacy of the education system in receiving new foreign pupils are some of the problems which arose. The extraordinariness of the phenomenon has led to hot discussions within the European countries and civil society and increased the interest of the European Union on those countries which will likely enter the Union in the future and where a high percentage of Roma population resides, i.e. Serbia. Nevertheless, Roma population is in the European continent since centuries and since many years measures to improve the situation of Roma population have been devised by various countries. Schooling has always been an important aspect: a high percentage of Roma (40%-50%) is indeed younger than 18 and focusing on children and young people seems to be a crucial step towards Roma inclusion. The net enrolment rate of Roma in primary education varies among the countries from 20% to 95%, whereas in most countries the enrolment is in the range of 40% to 60%. Yet, enrolment rates only tell part of the story: students may enrol at the beginning of the year, but may not actually attend school. The completion rate of primary school is in the range of 30% to 40% for most countries (Open Society Institute, 2008). However, to the best of our knowledge, there are not systematic studies in economic literature that

[1] The number of Roma and the subsequent numbers refer to the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Republic of Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine.

[2] Special schools are schools for children with special educational needs. Schools for adult education were initially introduced with the idea to provide basic literacy knowledge to adult pupils. Nowdays, however, they are mainly attended by pupils who are late at enrolling and by pupils which decided to return to school after dropping out.

try to investigate how to improve life circumstances of Roma in general and Roma kids in particular. This paper is a first attempt in this direction.

The Roma Teaching Assistant Programme[3] started in Serbia in the last decade and is the main programme targeting Roma inclusion in education in South Eastern Europe.[4] The programme began in 2002 as a pilot programme carried out by different NGOs. Since 2009 the Ministry of Education has been responsible for the coordination of the programme, which from 2007 to 2009 was led by the Organisation for Security and Cooperation in Europe (OSCE). In September 2010 the name of Roma assistants has been changed to "pedagogical assistants" and their target group is no longer only Roma but all children from marginalised groups.[5] Nonetheless, the Ministry of Education expects that mainly Roma children will benefit from this programme.

The aim of this paper is to evaluate the effects of the Roma Teaching Assistant Programme for the year 2009/2010. More precisely, we want to examine whether the programme is effective in reducing dropouts, raising attendance and improving the grades of Roma pupils, by means of a target increase in instruction time, help in homework and assignments and direct link between assistant and parents.

The paper is related to the literature on remedial education programmes targeting underachieving students. Policies targeting low-performing students are generally difficult to evaluate because children with learning difficulties are not randomly assigned to programmes: it is very difficult to distinguish between the effects of the programme and the selection into it. The selection mechanism is indeed not typically fully observable and few studies are able to overcome this problem. Among others, Lavy and Schlosser (2005) succeed in evaluating the effects of a remedial education programme for underperforming high school students in Israel; in United States Hanushek et al. (2002) investigates on learning-disabled or emotionally disturbed students and Jacob and Lefgren (2004) on low-achieving students. A way to overcome the selection bias and understand the impact of these programmes could be that of using randomised evaluations. An interesting and successful randomized experiment, for instance, has been conduced in schools in urban India by Banerjee et al. (2007). As part of the programme, underachieving third grade students would meet for two hours each day with an instructor during school hours. The remedial classes consisted of 15-20 students and they focused on the core

[3]The Serbian name of the programme is *Romski Asistenti - Pomoć u Nastavi*.

[4]The Serbian Government - together with Montenegro, Croatia, Macedonia, Hungary, Romania, Bulgaria, the Czech Republic and Slovakia - is participating in the *Decade of Roma Inclusion*, an international initiative running from 2005 to 2015 in Central and South-Eastern Europe. The initiative brings together governments, international and non-governmental organizations to improve the welfare of the Roma population, focusing on healthcare, education, employment and housing. Examples of other programmes which introduce Roma school assistants can be found in Czech Republic, Slovakia, Bulgaria and Croatia.

[5]The programme is now financed by the European Union and it is named *Education for All - Increasing the Availability and Quality of Education for Children from Marginalised Groups*.

competencies such as literacy and numeracy skills. Test scores of children in schools with remedial education improved in both the first and second year (Banerjee et al., 2007). Nonetheless, overall, results of remedial education programmes seem to be contrasting and country specific. The broad literature on programmes aiming at improving schooling outcomes of the poor suggests instead that conditional cash transfers, modelled after the Mexican programme PROGRESA, are successful in improving enrolment and attendance in many developing countries. However, policies that promote school enrolment may not promote learning. Early contributions suggest indeed that programmes which are effective at reducing absence from school, often do not have an impact on test scores of the average student (Schultz, 2004; Miguel and Kremer, 2004). Moreover, only providing school books and other school material does not seem to improve students achievements in the case of students with weaker academic backgrounds (Glewwe et al., 2009).

The rest of the paper is organised as follow. Section 2 gives a general overview of the Serbian education system and it summarises the main characteristics of Roma in Serbia. Section 3 gives a description of the Roma teaching assistants programme. Section 4 and 5 describe our data and present our results. Section 6 discusses our findings and concludes.

2 The Education System and Roma in Serbia

2.1 Primary Education System in Serbia

The Serbian education system consists of 8 years of primary school. School is compulsory until the age of 15. Children enrol at primary school if they are aged at least 6.5 years at the start of the scholastic year in September. Since 2007 the attendance of at least 6 months of a cost free preschool programme is compulsory; in 2010 the length of the compulsory preschool has been extended to 9 months. The obligatory preschool programme has been introduced in order to facilitate the transition to school for children from lower socioeconomic backgrounds.[6]

There are no school fees for primary school, but indirect costs such as books and other school material can pose a considerable cost for some parents. The Ministry of Education aims to reduce the cost of education and the first graders in 2009/2010 are the first generation which received free text books. The plan is that this generation and all younger generations obtain free school books in the future.

In the first four grades of primary school pupils have one teacher which teaches all subjects except English and an optional subject. In the upper four years of primary school pupils have one teacher per subject. In the first grade

[6]In the initial years the capacities of preschool institutions were not sufficient to enrol all preschool children. Hence, some children, mainly from poorer families or in rural areas, could not be enroled in preschool. However, due to the lack in the enforcement of the law, they were let to enrol in school also without having attended the compulsory preschool programme.

children get descriptive marks; from grade 2 on, the range of marks is 1 to 5 with 1 being the insufficient and worst mark. If a pupil has at least one insufficient in the lower four grades at the end of the year, her teacher can decide whether to let her pass to the upper grade or to ask her to take the retake exam in August. In the last few years the Ministry of Education has suggested schools to reduce repetition rates, especially in lower grades.

2.2 Data on Roma and Education of Roma

Data on Roma in Serbia are inaccurate and scarce. Official census data from 2002 suggest that in Serbia there are 108,000 Roma, although estimates put forward a number of somewhere between 350,000 to 500,000 or approximately 6% of the overall population (Open Society Institute, 2007). Most Roma live in segregated settlements and have considerably different demographic characteristics from the rest of the population. According to the World Bank Living Standard Measurement Survey (LSMS) 2003 - which provides a boosted sample of Roma in Serbia - the average household size of Roma population is of 4.5 household members and thus larger than the national average of 3.2. The average number of children younger than 18 years is 2.4 per Roma households, while the population average is only 0.9. 25% of Roma are younger than 10 and approximately 50% of the Roma population is younger than 23. Consequently, the average age of Roma is 25, whereas the average age in the country is 42.

The percentage of male Roma which declare to have worked over the last week is similar to the national average (70%). Nonetheless, the participation of females is only around 30% and therefore considerably lower than the national average (50%). Overall, approximately 60% of Roma have a consumption below the poverty line and weekly consumption of food per household member in Roma households is half the national average.

Turning to education, 60% of Roma younger than 18 have not completed primary education. In contrast, only 20% of overall population do not have a primary school diploma. Out of all children of primary school age, 30% of Roma children do not attend school whereas this is the case for only 1% of the overall population of primary school age. Using data from the National Assessment Study conducted with 3 grade students, Baucal (2009) finds that after the first 3 years of school Roma pupils lag 2.2 - 2.5 years behind the average student. Moreover, children from Roma ethnic minority performed worse on standardised tests than Serbian children with the same socioeconomic background.

The main barriers of access to education for Roma are: absence of documents, financial constraints, parents' low educational background, child labour, discrimination from teachers and pupils and language barriers.

In the recent years schools started enroling children with incomplete documents, but there still is a minor number of children not able to enrol due to lack of documents. According to the law, the local government is responsible

of informing schools and parents that children who reach the school age in the municipality have to enrol at school. But Roma are often not regularly registered as residents in the municipality and the local government is not able to reach out to them. As mentioned previously, school books and additional school material are a significant burden for the budget of poor families. The most poor among the Roma children do not even have adequate clothing for winter months and live in overcrowded homes where they do not have adequate conditions to pursue their studies. Plus, a majority of Roma parents has low educational attainment and this implies that they often cannot help their children with their school work. In addition, some parents attach little value to schooling and education. These reasons together imply that the perceived benefits of going to school (i.e. perceived returns to schooling) are extremely low compared to the respective costs. Moreover, in some cases Roma children help their parents in their work, e.g. they would go with their parents to collect rubbish or they would help them selling goods on the market. Other Roma kids have to take care of their younger brothers and sisters while the parents are working. An important aspect is also that Roma pupils face often discrimination from teachers and other pupils. For instance, they are often seated in the last row, teachers do not read their homework and do not encourage them in their studies. Frequently they are also sent to special schools. Finally, in a survey conducted by UNICEF (Multiple Indicator Cluster Survey, 2006) only 10% of Roma declare Serbian to be their mother tongue. As a consequence, children may face difficulties at school due to limited knowledge of Serbian.

3 The Roma Teaching Assistant Programme

The Roma Teaching Assistant Programme started as a pilot programme implemented by various NGOs in 2002 and in 2007 the OSCE took over the coordination and financing of the programme. In 2009 the programme has been institutionalised and is now under the coordination of the Ministry of Education. In 2009/2010 there were 48 primary schools which had a Roma assistant[7] and the Ministry expanded it to other 79 schools starting from October 2010. Based on when the programme started in a school, the schools can be divided in two groups: schools which have started with the programme in September 2009 (*Early Enrollees*) and schools which were assigned a Roma assistant starting with the scholastic year 2010/2011 (*Late Enrollees*).

The selection procedure for 26 *Early Enrollees* schools out of 78 schools which applied was conducted by OSCE based on certain criteria. Both schools and potential Roma assistants had to apply. Schools were chosen based on the following two criteria: firstly the percentage of Roma students between 5% and 40% and then, preferably, the availability of preschool programme in the

[7] 22 schools out of 48 have started with the programme at different points of time between 2002 and 2007. The selection on these schools was not centralised: they were chosen by NGOs because they were known for having a considerable percentage of Roma pupils. These schools are excluded from our analysis.

school.[8] The requirements for Roma assistants were knowledge of Romani, secondary school diploma and experience in working with children.

Schools which were assigned a Roma assistant in 2009/2010 received a description of her duties, but they are free to decide how to allocate the time of the assistant depending on the need of the school. In general, Roma assistants participate in regular lessons where they provide additional help to Roma pupils which have difficulties in following classes. Moreover, they organise additional lessons and help them with their homework and assignments. One day per week assistants dedicate to visiting their parents. In most cases Roma live in segregated settlements so that assistants can go to the settlement and visit several families. Usually they visit parents of children who have been absent from school and inform other parents on how children are doing at school. Their objectives indeed are: making sure that children go to school; preventing them from dropping out and helping them to succeed at school.

In 2010 the programme has been renamed to *Education for all* and starting with the scholastic year 2010/2011 Roma Teaching Assistants have been renamed to pedagogical assistants. The same criteria for the percentage of Roma students as in 2009/2010 has been applied for further 79 schools out of 300 which entered the programme in 2010/2011 (*Late Enrollees*). The only difference was that in 2010 also schools not offering the compulsory preschool programme could apply for an assistant. The reason is that in 2010/2011 pedagogical assistants were also introduced in 50 kindergartens which offer the compulsory preschool programme. Schools which were not offering the preschool programme could have then been close to kindergartens offering them. The Roma pupil would have been followed by an assistant from its entry in the school anyhow.[9] Selection criteria for now pedagogical assistants remained unchanged. Parents may have likely not been aware of the existence of the programme before enrolling their children. Data also confirm that *Early Enrollees* were not attracting more schools than *Late Enrollees*.[10] Therefore, we are confident that our analysis is not affected by possible selection of children into schools.

[8] 64 out of 78 schools which applied have a percentage of Roma beetwen 5% and 40%. Among these 64, they select 19 schools (out of 26) with a preschool programme, 5 schools (out of 37) with no preschool programme and a school for which no information is available.

[9] Unfortunately we do not have information on the availability of a preschool programme for schools applying in 2010/2011. Nonetheless, it is worthy to recall that some schools without the compulsory preschool programme have also been selected in the previous year.

[10] Roma pupils joining *Early Enrollees* schools only in the pretreatment year corresponded to 2.4% of Roma enrolled and in *Late Enrollees* they were 2.1%. In the year of the programme these percentages were respectively 1.6% and 1.3%. Thus, the number of Roma pupils reduced between the two years and it did it proportionally in both types of schools.

4 Data and Trends of the Variables

We have collected data from administrative records on 23 schools[11] from *Early Enrollees* and 15 schools from *Late Enrollees* (see Table 1). Schools are mainly in Belgrade/central area and in South/South-Eastern Serbia.[12] They are fairly located in both rural and urban areas.[13] Figure 1 in the appendix reports the distribution of schools from which we have collected data. In *pink* districts there are only *Early Enrollees*; in *green* districts there are only *Late Enrollees* and in *dark blue* districts there are both *Early* and *Late Enrollees*. We select the 15 control schools out of 79 which got an assistant in 2010 according to the following criteria: firstly they have to be in the same municipality of a *Early Enrollees* school[14]; secondly they have to be in a rural/urban district as the nearby *Early Enrollees* school; thirdly they have to share a similar school size to the nearby *Early Enrollees* school and finally a similar percentage of Roma pupils.[15]

Table 1: Programme timeline

	2009 Early Enrollees	2010 Late Enrollees
Number of schools applying to the programme	78	300
Number of schools joining the programme	26	79
Number of schools in our sample	23	15

The data set contains data on 4 scholastic years, that is, from 2006/2007 until 2009/2010 for the lower four grades of primary school for both Roma and non Roma children. It contains for each year and for each pupil the final mark in Mathematics, final mark in Serbian, end of year average and number of hours of absences in a year. For the scholastic years 2008/2009 and 2009/2010 we have also semester outcomes for Mathematics, Serbian, average and hours of absences. The data set contains personal characteristics, such as gender, year of birth, month of birth and place of birth[16], of 18,268 pupils.

[11] In total, there were 26 schools which got an assistant in 2009/2010. In 3 schools we were not allowed to collect data. These schools do not differ from the other schools neither in the number of pupils nor in the percentage of Roma children and they are located in different areas: one in Belgrade, one in the central area of the country and one in the South.

[12] 10 schools are located in Belgrade; 8 schools in the central area of the country (5 schools in the municipality of Valjevo and 3 in the municipality of Novi Sad); 12 schools in South-Eastern Serbia (3 schools in the municipality of Jagodina, 2 in Kragujevac, 3 in Kruševac, 3 in Zaječar and 1 in Požarevac); 8 schools in the South of the country (6 schools in the municipality of Leskovac and 2 in the municipality of Niš).

[13] We define urban area a district with more than 35,000 inhabitants.

[14] A municipality is made by more districts.

[15] In few cases the school chosen was not available and we needed to select the second option.

[16] It is worthy to mention that Roma in Serbia are mainly sedentary: they do not move much within the country. Nonetheless, there is a substantial out-migration, especially towards the European Union, and in the last years in-migration has increased due to the wars in Ex-Jugoslavia. Many Roma refugees in Serbia, for instance, come from Kosovo.

School specific data include information on school size, number of Roma - in both school and class - and whether the school is in a urban setting.

Table 2 and 3 summarise respectively the averages of the control variables and main outcomes for Roma and non Roma children in the pre- and treatment year. The mean characteristics of the schools that were enrolled in the programme later (column 2 and 5) resemble those of the schools that enrolled first (column 1 and 4). The table shows no statistically significant differences between *Early Enrollees* and *Late Enrollees* nor in the student's and school characteristics nor in the outcomes of interest. This similarity between *Early Enrollees* and *Late Enrollees* schools is found also in the treatment year, providing some support for our claim that *Early Enrollees* and *Late Enrollees* are comparable.[17]

Table 2: Averages of control variables in pre- and treatment year

	Pretreatment year			Treatment year		
	Early Enrollees (1)	Late Enrollees (2)	Difference (1-2) (3)	Early Enrollees (1)	Late Enrollees (2)	Difference (1-2) (3)
Female:						
Roma	0.5	0.47	0.03	0.49	0.47	0.02
			(0.02)			(0.26)
Non Roma	0.49	0.48	0.01	0.47	0.49	-0.02
			(0.014)			(0.013)
Born in same town:						
Roma	0.86	0.81	0.05	0.88	0.81	0.07*
			(0.04)			(0.35)
Non Roma	0.92	0.91	0.01	0.93	0.92	0.01
			(0.011)			(0.011)
Roma per School	0.22	0.19	0.03	0.19	0.23	-0.04
			(0.06)			(0.06)
School size	305	361	-56	301	363	-62
			(52.96)			(56.04)
No. of Roma per Class	4.91	4.39	0.52	5.25	4.49	0.76
			(1.33)			(1.48)
No. of Roma per Class	5.56	4.64	0.92	5.9	4.6	1.3
(if at least a Roma)			(1.35)			(1.48)
Class size	22.16	23.97	-1.8	22.44	24.21	-1.77
			(1.42)			(1.38)
Number of schools	23	15		23	15	
Number of Roma pupils	1241	811		1268	847	
Number of Non Roma pupils	4303	3374		4122	3514	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors corrected for clustering at the school level are reported in parentheses.

Three important aspects need to be stressed when comparing Roma and non Roma children. On a grading scale of 1 to 5, the difference of almost two grades between Roma and non Roma pupils in Serbian and Mathematics is very large: for instance, the average in Mathematics for Roma in *Late Enrollees* is 2.37 in 2008/2009 whereas it is 4.17 for non Roma; for Serbian it is 2.55 for Roma and 4.33 for non Roma. This gap is even more explicit when looking at having insufficient average (at least one insufficient grade): among Roma on average almost 20% of pupils have an insufficient grade; the corresponding percentage for non Roma is not even 1%. Moreover, dropouts seem to be almost exclusively of Roma children: in 2008/2009 in *Late En-*

[17]The only significant difference is found for the place of birth of Roma children: there are less migrant children in treated schools.

Table 3: Averages of outcomes in pre- and treatment year

	Pretreatment year			Treatment year		
	Early Enrollees (1)	Late Enrollees (2)	Difference (1-2) (3)	Early Enrollees (1)	Late Enrollees (2)	Difference (1-2) (3)
Mathematics:						
Roma	2.28	2.37	-0.9	2.36	2.40	-0.04
			(0.05)			(0.05)
Non Roma	4.25	4.17	0.07	4.3	4.2	0.01
			(0.02)			(0.02)
Serbian:						
Roma	2.43	2.55	-0.12	2.49	2.56	-0.7
			(0.05)			(0.05)
Non Roma	4.4	4.33	0.07	4.43	4.34	0.09
			(0.02)			(0.02)
Average:						
Roma	2.56	2.75	-0.19	2.73	2.80	0.7
			(0.06)			(0.5)
Non Roma	4.54	4.48	0.06	4.57	4.5	0.07
			(0.02)			(0.016)
Insufficient average:						
Roma	0.24	0.19	0.05	0.168	0.164	0.04
			(0.02)			(0.016)
Non Roma	0.8	1	-0.2	0.7	0.68	0.02
			(0.002)			(0.002)
Dropout:						
Roma	0.0153	0.0197	-0.0044	0.026	0.035	-0.009
			(0.006)			(0.007)
Non Roma	0.001	0.0006	0.0004	0.001	0	0.001**
			(0.006)			(0.0005)
Absences:						
Roma	118	125	-7	134	155	-21
			(6.51)			(6.74)
Non Roma	39	36	3	42	40	2
			(1.02)			(0.97)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors corrected for clustering at the school level are reported in parentheses.

rollees among Roma children 1.97% dropout with respect to 0.06% among non Roma children. Lastly, Roma children show to be absent from school approximately three to four times as much as non Roma children. In terms of schooling days, a non Roma child is absent from school approximately 7 to 8 days in a year, a Roma child misses school on average somewhere between 23 and 25 days in year.

By simply comparing the averages of outcomes of pre- and treatment year, we can see that for Roma children there is both a slight improvement in all marks and a decrease in the percentage of students with an insufficient average. These effects are larger in *Early Enrollees* than in *Late Enrollees*. Dropouts almost double in the last year. The reason for this sharp increase is likely related to the liberalisation of the visa regime with the European Union which induced a certain number of Roma families to migrate to the EU. Finally, absences increase in 2009/2010 in both *Early Enrollees* and *Late Enrollees* for both Roma and non Roma, but for Roma they increase by less in *Early Enrollees* schools.

5 Identification Strategy

The aim of the paper is to evaluate the effects of the programme on educational outcomes on pupils in the first four grades of school. More precisely, we want to examine the impact of the programme on dropouts, attendance and grades of Roma pupils. We intend to address the following questions:

- Does the programme have an impact on Roma pupils' grades?
- Does the programme reduce dropouts rates of Roma pupils?
- Does the programme increase attendance rates of Roma pupils?

The ideal experiment would require having a random selection of the schools assigned to the programme. Unfortunately, we are not in this setting: schools were not chosen randomly to participate. Nonetheless, the gradual implementation of the programme allows us to base the evaluation on a comparison of *Early* and Late Enrollees. Our treatment group are schools which started to implement the programme in September 2009 (*Early Enrollees*) whereas the control group is a subsample of schools which got the assistants starting from October 2010 (*Late Enrollees*). There is certainly the concern that schools starting the programme in the two different years may differ because schools had to apply in order to get selected for the programme. Although the selection criteria remain almost the same, we do not know what motivates schools to apply before others and whether these motivations are related to differences in the principle or in school quality.[18] We do know, though, that the committee which decided in both years - composed by the Minister of Education and other representatives of the Ministry, representatives of National Council, OSCE and representatives of Ministry for Human and Minority Rights - gave priority to schools in the poorest municipalities or with huge Roma settlements[19] and rated schools based on their shown interested and motivation (application). Placebo tests are one possibility to ensure the robustness of our results. Another possibility is comparing older cohorts less exposed to the programme (control group) to the younger cohorts (treated group) exposed to the programme from *Early Enrollees*-treated schools.

The advantages and disadvantages of both control groups need to be mentioned. The first control group consists of schools which enroled later in the programme. The main advantage of this group is that the impact of the programme would not be confounded with other government policies which took place in the year of the introduction of the programme. For instance, in 2009/2010 all first grade pupils got free text books and in the last few years the Ministry is strongly suggesting to schools to reduce repetition rates

[18] In 2009/2010 the programme was advertised in newspapers *Politika* and Prosvetni Pregled, the last being a newspaper for people working in the education sector; in 2010/2011 schools' directorates - one directorate may be responsible for more than a municipality - were encharged to send applications directly to schools.

[19] Subotica, Novi Sad, Niš, Kragujevac, Belgrade.

especially in the lower grades. The disadvantage of this control group - as mentioned before - is that we are not able to control for the differences which have led some schools to enter the programme before the other schools.

Using older cohorts in the treatment schools as a control group eliminates obviously the possible problem of selection bias which we have if we use *Late Enrollees* schools as controls. But, this identification strategy relies on the assumtion that there were no government interventions over the period and that the outcomes have a regular trend over the years.

5.1 First Approach: Comparison of 2008/2009 vs. 2009/2010

Our first approach identification strategy exploits the fact that some schools received assistants prior to other schools. We compare *Early Enrollees* schools with *Late Enrollees* schools in the years 2008/2009 when there was no programme and 2009/2010 when the programme got introduced.

5.1.1 Average treatment approach

Our specification (1) is the difference-in-difference model with school fixed effects without any control:

$$Y_{ijt} = \beta_0 + \delta_t + \rho_j + \beta_1 treatment_j * post_t + \varepsilon_{ijt} \quad (1)$$

The outcome variables Y_{ijt} are final marks in Serbian and Mathematics, average final mark, probability to have an insufficient average, probability to dropout and absences of individual i, in school j at time t. δ_t is a time fixed effect, ρ_j corresponds to school fixed effects, and $treatment_j * post_t$ is the interaction term between the dummy for treatment year and treatment status of the school.

Specification (2) includes control variables X'_{ijt}:

$$Y_{ijt} = \beta_0 + \delta_t + \rho_j + \beta_1 treatment_j * post_t + \beta_2 X'_{ijt} + \varepsilon_{ijt} \quad (2)$$

Our control variables X'_{ijt} include school size, school size squared, number of Roma in school, number of Roma in school squared, percentage of Roma in class, class size, class size squared, the gender of the child (=1 if the child is female), age, age squared, and whether the kid is a migrant (=1 if child was born in the same town where s/he attends school).

The coefficient of interest is the difference-in-difference estimator of the interaction term between time and treatment which captures the difference in outcomes between the treatment and control schools.

The results of the regressions for the different outcomes of interest are reported in Tables 4 and 5.[20] They suggest that the programme had only a statistically significant impact on absences. Pupils exposed to the programme were on average 3 to 4 days less absent than pupils not exposed to the programme. This is especially the case for male, whose reduction in absences is

[20]The coefficients for control variables are reported only for the first outcome: Mathematics. They do not change for the other outcomes of interest and they are thus not reported anymore. Complete results are available upon request.

of almost 5 days. Results are statistically significant at 5%. Marks in Mathematics, Serbian, the average and the probability to have an insufficient grade would suggest that the programme had a positive impact on Roma pupils but coefficients do not show to be significant. The coefficient for the probability to dropout is also not statistically significant: the overall effect on dropouts seems to be driven by an increase in girls' dropouts. Dropouts and absences also increase in the fourth grade. Overall, the higher the percentage of Roma in a class, the worse their average marks and the higher is their number of hours of absences. Class size is statistically insignificant in all regressions, but school size turns out to be significant in some specifications and, as we would expect, it has a negative impact on marks.

We investigate further the impact of the programme by differentiating between migrants and no migrants and between late starters and no late starters. Migrants, often refugees from Kosovo, and late starters are likely to experience more difficult conditions with respect to other children and are indeed expected to perform worse in schools. The programme had a significant impact on Serbian and average marks for migrants. Absences reduce significantly only for no late starters: those exposed to the programme were on average 3 to 4 days less absent than pupils not exposed to the programme (Table 6).

5.1.2 Intensity of treatment approach

The following specification is a variation of the previous approach and it exploits the within school variation of Roma and the fact that the programme intensity depends on the number of Roma in a school. Each school has only one assistant implying that the higher the number of Roma children the less intense is the programme. Schools are thus devided in four quartiles, depending on the number of Roma children per school: schools in the fourth quartile have the highest number of Roma. [21] The main difference to the prior model is that we interact the number of Roma ($no.Roma$) per school with time and treatment. The coefficient of interest is now β_6.

The intensity of treatment model:

$$\begin{aligned} Y_{ijt} = \beta_0 + \delta_t + \beta_1 treatment_j + \beta_2 treatment_j * post_t + \beta_3 no.Roma_{jt} + \\ + \beta_4 no.Roma_{jt} * post_t + \beta_5 no.Roma_{jt} * treatment_j + \\ + \beta_6 no.Roma_{jt} * treatment_j * post_t + \varepsilon_{ijt} \end{aligned} \quad (3)$$

The regressions results are in Tables 7 and 8. Again we have two specifications: without controls (1) and with controls (2) and we look at the impacts by gender, grade, migrant status of the child and whether s/he is late or no late starter. The programme had a significant positive impact on Mathematics, average, insufficient average at the end of the year and hours of absences

[21] The average number of Roma between two years - pre- and treatment year - is used in order to define the quartile.

in schools with a lower number of Roma. The higher is the number of Roma, the lower the impact on the outcomes of interest. Absences, for instance, reduce by 17 days in a year when the school is in the first quartile of schools' distribution; when the school is in the second quartile, this reduction is almost nullified. This is especially the case for female, for whom being in a school with a lower number of Roma seems to be more favourable. Striking are the results on migrants: impacts in the first quartile are big and highly statistically significant (Table 9).

5.1.3 Placebo Regressions

The difference-in-difference approach relies on the parallel trends assumption. That is, we assume that, in the absence of the programme, treatment and comparison schools would have had a parallel trend in the average outcomes of interest. Figures 2 show the trends for the four year period of outcome variables. Overall, all outcomes show to follow a fairly parallel trend: marks improve in both treated and control schools.[22] The cyclicality over the years of the percentage of dropouts for Roma children is hard to interpret. As mentioned before, the reason for the sharp increase in dropouts in the last year is likely related to the liberalisation of the visa regime with the European Union and the consequent migration.

The most obvious way to examine the robustness of our results is however to run the same regressions (regression (1), (2), and (3)) for the years 2006/2007 versus 2007/2008 (placebo test 1) and for the years 2007/2008 versus 2008/2009 (placebo test 2). These two placebo tests allow us to test if treatment and comparison schools are comparable; in other words, in this way we can test if the outcomes in the two groups of schools had a parallel trend before the introduction of the programme. Significant difference in difference coefficients in the case of average treatment approach or a significant triple difference coefficient in the case of treatment intensity approach in the years prior to the introduction of the programme would question the adequacy of our comparison group. The two placebo tests suggest that our results are robust.

5.2 Second approach: Cohort regressions

In our second approach we try to circumenvent the problem of possible selection bias by using as control schools older cohorts from treatment schools. We compare kids in the first grade (young cohorts) with kids in older grades - second, third and fourth (old cohorts) in the pre- and treatment year. We select the first grade because assistants are expected to work mainly with first grades of primary school. We firstly estimate the following regression for *Early Enrollees*:

$$Y_{ijt} = \beta_0 + \beta_1 young_i + \beta_2 post_t + \beta_3 young_i * post_t + \varepsilon_{ijt} \quad (4)$$

[22]The main differences can be found between the years 2006 and 2007, the first two years in our study.

where Y_{ijt} are again final marks in Serbian and Mathematics, average final mark, probability to have an insufficent average, probability to dropout and hours of absences of individual i, in school j and at time t; $young_t$ is equal to 1 when the child is at the first grade; $post_t$ is equal to 1 in the year of the treatment (2009/2010). The coefficient of interest is now β_3.

This approach is correct only if in the period there were no government interventions which changed the trend of the outcomes. We know, though, that in the last few years the Ministry is strongly suggesting schools to reduce repetition rates and the way this suggestion has been perceived and applied may depend on the school. As mentioned before, both control groups have advantages and disadvantages. A possible way to better take into account strengths and weaknesses of both approachs may be therefore combaining the *Early - Late Enrollees* analysis with the cohort one. The same regression (4) is then estimated for *Late Enrollees* and the triple difference between treated and control schools and cohorts is captured by γ_3 in the following specification:

$$Y_{ijt} = \beta_0 + \beta_1 young_i + \beta_2 post_t + \beta_3 young_i * post_t + \gamma_1 treatment_j * post_t + \\ + \gamma_2 young_i * treatment_j + \gamma_3 young_i * post_t * treatment_j + \varepsilon_{ijt} \tag{5}$$

The regressions are estimated without and with controls, as in previous specifications. We also look at the impacts by gender, grade, migrant status of the child and whether s/he is a late or no late starter. Results are in the Tables 10 and 11.

We find that the programme had a positive impact on marks (Mathematics and Serbian) and reduced dropouts on average by 6.6 percentage points in the first grade. Contrary to the average treatment approach where girls seemed to drop out more due to the programme, now in the first grade both girls' and boys' dropouts reduce, although girls' reduce by less. Moreover, number of absences surprisingly increases in both treated and control schools: we would have expected that exposure to the programme would decrease them. However, we find that the increase in absences is smaller in *Early Enrollees* than in *Late Enrollees* schools, confirming the results obtained by the average treatment approach also in the magnitude of the difference (5/6 school days). Although the coefficient is not statistically significant, it suggests that, in the absence of treatment, the absences would have had possibly an even larger increase.

Consistent results with the previous approach are also obtained for migrants: their marks increase considerably. Results are statistically significant at 1%. Late starters confirm not to be affected by the programme (Tables 12 and 13).

5.2.1 Placebo Regressions

Again, we need to control for the robustness of our results by running regressions ((regression (4), (5)) for the years 2006/2007 versus 2007/2008 (placebo

test 1) and for the years 2007/2008 versus 2008/2009 (placebo test 2). The two placebo tests suggest that our results are robust.

6 Conclusion

In this paper we have aimed to estimate the impact of the Roma Teaching Assistant Programme in its first year of implementation on different outcomes of interest.

We use a difference-in-difference approach. Our first estimation strategy exploits the fact that the introduction of assistants was gradual. The main drawback of this identification strategy is the fact that some schools entered the programme before the others was not random: schools and assistants needed to apply to the programme.

The second identification strategy compares pupils from treated schools with older cohorts from the same schools. This identification strategy controls well for schools specific characteristics, but we are not able to control for government interventions which might have taken place over the period. Therefore, we combine the two approaches (*Early - Late Enrollees* with cohort analysis) and estimate the triple difference between treated and control schools and young and old cohorts.

Our results suggest that the programme had a modest effect. We find that marks have improved, especially for migrants, and dropout have reduced. These effects are consistent for first grades. There is also evidence that children exposed to the programme went on average more to school. Higher and more systematic impacts are obtained in schools with a lower number of Roma: the higher is their number, the lower the impact of the programme on the outcomes of interest. This seems to be especially the case for female and migrants, for whom being in a school with a lower number of Roma turns out to be more favourable.

The modest effects should not be interpreted as a failure of the programme. This study has looked only at the impact of the programme in its first year. It is possible that assistants and schools need some time to adjust to the new role of the assistant and that the full benefit from assistants will come at a later stage. Nevertheless, our results suggest that the programme is effective in schools with less Roma. It would be worth rethinking to assign more than one assistant to schools with a large number of Roma in the school.

References

Banerjee, A. V., S. Cole, E. Duflo, and L. Linden (2007). Remedying Education: Evidence from Two Randomized Experiments in India. *The Quarterly Journal of Economics 122*(3), 1235–1264.

Baucal, A. (2009). Development of Mathematical and Language Literacy among Roma Students. *Psihologija 39*(2), 207–227.

Glewwe, P., M. Kremer, and S. Moulin (2009). Many Children Left Behind? Textbooks and Test Scores in Kenya. *American Economic Journal: Applied Economics 1*(1), 112–135.

Hanushek, E. A., J. F. Kain, and S. G. Rivkin (2002). Inferring Program Effects for Specialized Populations: Does Special Education Raise Achievement for Students with Disabilities. *Review of Economics and Statistics 84*(4), 584–599.

Jacob, B. A. and L. Lefgren (2004). Remedial education and student achievement: A regression discontinuity analysis. *Review of Economics and Statistics 86*(1), 226–244.

Lavy, V. and A. Schlosser (2005). Targeted Remedial Education for Underperforming Teenagers: Costs and Benefits. *Journal of Labour Economics 23*(4), 839–874.

Miguel, E. and M. Kremer (2004). Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities. *Econometrica 72*(1), 159–217.

Open Society Institute (2007). Equal Access to Quality Education For Roma.

Open Society Institute (2008). International Comparative Data Set.

Schultz, P. T. (2004). School subsidies for the poor: evaluating the Mexican Progresa poverty program. *Journal of Development Economics 74*(1), 199–250.

7 Tables

Table 4: Average treatment approach - A

MATHEMATICS	(1) without controls	(2) with controls	(3) female	(4) male	(5) first grade	(6) second grade	(7) third grade	(8) fourth grade
post	0.051	0.065	0.096	0.041	-0.076	0.040	0.208*	0.168*
	(0.069)	(0.062)	(0.080)	(0.056)	(0.175)	(0.126)	(0.117)	(0.085)
treatment*post	0.046	0.030	0.015	0.053	0.213	-0.085	0.040	-0.156
	(0.081)	(0.077)	(0.091)	(0.085)	(0.221)	(0.192)	(0.146)	(0.158)
school size		-0.010***	-0.011***	-0.009***	-0.014	-0.002	-0.013	0.005
		(0.002)	(0.003)	(0.002)	(0.013)	(0.005)	(0.008)	(0.007)
school size squared		0.000***	0.000***	0.000***	0.000	-0.000	0.000**	-0.000*
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
no. Roma (school)		0.019***	0.016*	0.023***	0.016	0.028	-0.017	0.020
		(0.005)	(0.008)	(0.007)	(0.026)	(0.020)	(0.027)	(0.023)
no. Roma (school) squared		-0.000***	-0.000***	-0.000***	-0.000	-0.000	-0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Roma per class		-0.182	-0.381	0.050	-0.477	0.270	0.272	0.153
		(0.258)	(0.267)	(0.338)	(0.487)	(0.543)	(0.310)	(0.554)
class size		0.021	-0.002	0.057	-0.001	0.049	0.008	0.080
		(0.055)	(0.059)	(0.059)	(0.104)	(0.099)	(0.076)	(0.088)
class size squared		-0.001	-0.000	-0.001	-0.000	-0.001	0.000	-0.002
		(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
female		0.106**			0.025	0.124**	0.082	0.093
		(0.046)			(0.099)	(0.058)	(0.084)	(0.058)
age		-0.115	-0.009	-0.131	-1.099***	-0.726***	-0.472**	-0.772
		(0.164)	(0.184)	(0.187)	(0.390)	(0.193)	(0.201)	(0.481)
age squared		0.001	-0.005	0.002	0.060***	0.031***	0.013	0.027
		(0.008)	(0.010)	(0.009)	(0.022)	(0.010)	(0.009)	(0.021)
migrant		0.047	-0.033	0.116	0.150	0.106	0.003	-0.029
		(0.065)	(0.106)	(0.079)	(0.134)	(0.083)	(0.081)	(0.080)
constant	2.082***	3.757***	3.964***	3.028**	8.792***	4.752***	6.775***	5.402*
	(0.021)	(1.040)	(1.159)	(1.152)	(2.352)	(1.544)	(1.634)	(2.854)
school FEs	yes	yes	yes	yes	yes	yes	yes	yes
No. observations	4085	3961	1916	2045	989	1111	988	873
R2	0.086	0.109	0.134	0.110	0.162	0.169	0.195	0.159

Standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Average treatment approach - B

	(1) without controls	(2) with controls	(3) female	(4) male	(5) first grade	(6) second grade	(7) third grade	(8) fourth grade
SERBIAN								
post	0.039	0.046	0.079	0.027	-0.048	0.099	0.222***	0.109
	(0.060)	(0.048)	(0.055)	(0.050)	(0.132)	(0.133)	(0.079)	(0.076)
treatment*post	0.044	0.012	-0.035	0.058	0.121	-0.130	-0.110	-0.075
	(0.069)	(0.066)	(0.075)	(0.080)	(0.177)	(0.207)	(0.097)	(0.177)
AVERAGE								
post	0.042	0.064	0.104	0.037	-0.064	-0.010	0.335***	0.063
	(0.059)	(0.058)	(0.092)	(0.051)	(0.162)	(0.157)	(0.121)	(0.086)
treatment*post	0.104	0.090	0.034	0.150	0.203	0.048	-0.058	0.111
	(0.072)	(0.080)	(0.104)	(0.103)	(0.209)	(0.246)	(0.154)	(0.211)
No. observations	4085	3961	1916	2045	989	1111	988	873
INSUFFICIENT								
post	-0.034	-0.039	-0.053	-0.027	-0.041	-0.007	-0.090	-0.044
	(0.029)	(0.028)	(0.035)	(0.031)	(0.079)	(0.062)	(0.055)	(0.028)
treatment*post	-0.043	-0.031	0.013	-0.075	-0.045	0.014	-0.020	-0.038
	(0.036)	(0.039)	(0.041)	(0.051)	(0.099)	(0.098)	(0.069)	(0.078)
DROPOUT								
post	0.017**	0.015**	0.001	0.027**	0.067***	-0.014*	0.011***	-0.007
	(0.007)	(0.006)	(0.010)	(0.012)	(0.016)	(0.008)	(0.004)	(0.011)
treatment*post	-0.006	0.003	0.028*	-0.018	-0.037	0.027*	-0.004	0.045**
	(0.009)	(0.009)	(0.014)	(0.014)	(0.025)	(0.013)	(0.011)	(0.020)
No. observations	4167	4039	1951	2088	1005	1140	1009	885
ABSENCES								
post	31.236***	32.853***	22.456***	42.034***	64.693**	19.900	21.515*	-0.007
	(7.856)	(9.078)	(10.797)	(10.764)	(28.341)	(23.608)	(17.049)	(0.020)
treatment*post	-17.299**	-16.679*	-4.713	-26.119**	-28.336	-19.406	-10.048	0.045**
	(7.856)	(9.078)	(10.797)	(10.764)	(28.341)	(23.608)	(17.049)	(0.020)
No. observations	3980	3868	1871	1997	945	1084	980	885

Standard errors in parentheses:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Average treatment approach by subgroups

	(1) all	(2) migrant	(3) no migrant	(4) late starter	(5) no late starter
MATHEMATICS					
post	0.065	-0.087	0.103	0.036	0.040
	(0.062)	(0.063)	(0.069)	(0.076)	(0.060)
treatment*post	0.030	0.187	-0.012	-0.072	0.064
	(0.077)	(0.123)	(0.083)	(0.131)	(0.081)
SERBIAN					
post	0.046	-0.108	0.091*	-0.021	0.031
	(0.048)	(0.073)	(0.051)	(0.072)	(0.047)
treatment*post	0.012	0.265**	-0.048	-0.012	0.026
	(0.066)	(0.098)	(0.068)	(0.119)	(0.062)
AVERAGE					
post	0.064	-0.036	0.097*	0.034	0.023
	(0.058)	(0.075)	(0.057)	(0.110)	(0.050)
treatment*post	0.090	0.276*	0.037	0.077	0.108
	(0.080)	(0.142)	(0.076)	(0.181)	(0.067)
No. observations	3961	591	3370	878	3083
INSUFFICIENT					
post	-0.039	-0.011	-0.050*	-0.074	-0.017
	(0.028)	(0.035)	(0.028)	(0.060)	(0.021)
treatment*post	-0.031	-0.051	-0.021	0.010	-0.040
	(0.039)	(0.061)	(0.040)	(0.090)	(0.031)
DROPOUT					
post	0.015**	0.025	0.011**	0.033	0.012*
	(0.006)	(0.016)	(0.004)	(0.028)	(0.007)
treatment*post	0.003	0.003	0.006	0.037	-0.003
	(0.009)	(0.027)	(0.006)	(0.038)	(0.008)
No. observations	4039	615	3424	905	3134
ABSENCES					
post	32.853***	35.488*	29.331***	26.388	37.998***
	(6.551)	(18.866)	(5.012)	(27.384)	(4.675)
treatment*post	-16.679*	-39.673	-9.294	-12.740	-17.783**
	(9.078)	(25.205)	(8.355)	(28.282)	(7.474)
No. observations	3868	576	3492	853	3015

Standard errors in parentheses:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Intensity of average treatment - A

MATHEMATICS	(1) without controls	(2) with controls	(3) female	(4) male	(5) first grade	(6) second grade	(7) third grade	(8) fourth grade
post	-0.159	-0.053	-0.140	0.054	-0.916	-0.306	1.360***	-1.000**
	(0.184)	(0.164)	(0.159)	(0.188)	(0.650)	(0.191)	(0.184)	(0.383)
treatment	-0.603**	-0.477**	-0.705**	-0.236	-0.944***	-1.028***	0.635**	-0.911**
	(0.235)	(0.229)	(0.272)	(0.250)	(0.328)	(0.301)	(0.289)	(0.347)
no. Roma_2	-0.702***	-0.606**	-0.617***	-0.570**	-0.732***	-1.148***	0.739*	-0.993***
	(0.237)	(0.225)	(0.222)	(0.252)	(0.224)	(0.272)	(0.368)	(0.365)
no. Roma_3	-0.560**	-0.344	-0.523	-0.168	-0.562*	-0.409	0.282	-1.070***
	(0.214)	(0.251)	(0.342)	(0.225)	(0.327)	(0.376)	(0.244)	(0.387)
no. Roma_4	-0.559**	-0.638***	-0.781***	-0.495**	-1.018***	-0.958***	0.216	-1.147***
	(0.227)	(0.221)	(0.277)	(0.221)	(0.279)	(0.283)	(0.227)	(0.396)
treatment*post	0.660***	0.521***	0.803***	0.204	1.880**	0.965***	-1.271***	1.264**
	(0.192)	(0.171)	(0.173)	(0.233)	(0.707)	(0.348)	(0.290)	(0.480)
no. Roma*post_2	0.007	-0.156	-0.206	-0.154	-0.019	0.673***	-2.021***	1.180***
	(0.196)	(0.176)	(0.176)	(0.195)	(0.643)	(0.220)	(0.378)	(0.420)
no. Roma*post_3	0.070	0.013	0.113	-0.100	0.961	-0.098	-1.078***	0.939**
	(0.201)	(0.198)	(0.237)	(0.202)	(0.752)	(0.279)	(0.318)	(0.400)
no. Roma*post_4	0.348*	0.259	0.408**	0.094	1.100	0.478*	-1.162***	1.257***
	(0.190)	(0.169)	(0.165)	(0.195)	(0.652)	(0.264)	(0.239)	(0.424)
no. Roma*treatment_2	0.835**	0.682**	0.783**	0.539	1.359***	1.456***	-1.064**	1.077***
	(0.319)	(0.320)	(0.336)	(0.362)	(0.472)	(0.352)	(0.484)	(0.386)
no. Roma*treatment_3	0.753**	0.419	0.776*	0.026	0.607	0.706	-0.724*	1.404***
	(0.290)	(0.318)	(0.454)	(0.303)	(0.450)	(0.449)	(0.382)	(0.448)
no. Roma*treatment_4	0.408	0.425	0.656*	0.187	0.874**	1.080***	-0.537	0.851**
	(0.291)	(0.264)	(0.346)	(0.265)	(0.401)	(0.318)	(0.367)	(0.385)
no. Roma*treatment*post_2	-0.508**	-0.325*	-0.464**	-0.116	-1.497**	-1.180***	2.237***	-1.552***
	(0.213)	(0.190)	(0.199)	(0.251)	(0.728)	(0.375)	(0.458)	(0.526)
no. Roma*treatment*post_3	-0.586**	-0.500**	-0.815***	-0.137	-1.883**	-0.666	1.456***	-1.574**
	(0.225)	(0.231)	(0.269)	(0.288)	(0.811)	(0.474)	(0.440)	(0.615)
no. Roma*treatment*post_4	-0.760***	-0.636***	-1.022***	-0.220	-1.823**	-1.252***	0.983***	-1.349**
	(0.207)	(0.190)	(0.196)	(0.251)	(0.719)	(0.414)	(0.354)	(0.539)
constant	2.897***	2.596***	2.993**	2.351**	8.783***	6.549***	5.022***	6.987**
	(0.179)	(0.921)	(1.271)	(0.951)	(1.804)	(1.151)	(1.336)	(2.658)
No. observations	4085	3961	1916	2045	989	1111	988	873
R2	0.027	0.060	0.063	0.058	0.108	0.116	0.136	0.102

Standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Intensity of average treatment - B

	(1) without controls	(2) with controls	(3) female	(4) male	(5) first grade	(6) second grade	(7) third grade	(8) fourth grade
SERBIAN								
treatment*post	0.474*	0.358	0.450*	0.242	1.080	0.763**	-0.848***	0.801**
	(0.244)	(0.231)	(0.253)	(0.273)	(0.697)	(0.363)	(0.303)	(0.374)
no.Roma*treatment*post_2	-0.389	-0.234	-0.209	-0.216	-0.433	-0.883**	1.719***	-1.627**
	(0.283)	(0.256)	(0.303)	(0.291)	(0.733)	(0.434)	(0.458)	(0.641)
no.Roma*treatment*post_3	-0.350	-0.277	-0.469	-0.050	-0.871	-0.307	0.491	-0.784
	(0.273)	(0.271)	(0.310)	(0.323)	(0.716)	(0.463)	(0.383)	(0.602)
no.Roma*treatment*post_4	-0.559**	-0.467*	-0.648**	-0.268	-1.081	-1.092**	0.517	-0.722
	(0.252)	(0.241)	(0.260)	(0.286)	(0.697)	(0.431)	(0.317)	(0.436)
AVERAGE								
treatment*post	0.460***	0.396***	0.742***	0.011	1.830**	0.642	-1.028***	0.618
	(0.112)	(0.095)	(0.154)	(0.189)	(0.746)	(0.395)	(0.222)	(0.386)
no.Roma*treatment*post_2	-0.238	-0.161	-0.430**	0.174	-1.328*	-1.052**	2.008***	-0.897*
	(0.146)	(0.141)	(0.175)	(0.250)	(0.767)	(0.459)	(0.397)	(0.485)
no.Roma*treatment*post_3	-0.338*	-0.314	-0.811***	0.240	-1.810**	-0.020	0.957**	-0.626
	(0.170)	(0.193)	(0.260)	(0.303)	(0.841)	(0.516)	(0.423)	(0.674)
no.Roma*treatment*post_4	-0.461***	-0.410***	-0.846***	0.062	-1.779**	-0.754	0.571	-0.211
	(0.141)	(0.138)	(0.211)	(0.211)	(0.750)	(0.479)	(0.343)	(0.454)
No. observations	4085	3961	1916	2045	989	1111	988	873
INSUFFICIENT								
treatment*post	-0.111**	-0.137***	-0.208***	-0.053	-0.562***	-0.102	0.040	0.003
	(0.051)	(0.036)	(0.063)	(0.080)	(0.108)	(0.060)	(0.128)	(0.068)
no.Roma*treatment*post_2	-0.037	-0.002	0.107	-0.120	0.248*	0.288**	-0.456***	0.084
	(0.087)	(0.069)	(0.077)	(0.125)	(0.141)	(0.117)	(0.160)	(0.181)
no.Roma*treatment*post_3	0.025	0.051	0.214**	-0.126	0.516**	-0.161	-0.085	-0.015
	(0.078)	(0.082)	(0.082)	(0.142)	(0.217)	(0.172)	(0.197)	(0.170)
no.Roma*treatment*post_4	0.120*	0.147**	0.263**	0.019	0.650***	0.106	0.088	-0.190
	(0.069)	(0.059)	(0.099)	(0.094)	(0.129)	(0.118)	(0.179)	(0.118)
DROPOUT								
treatment*post	0.009	-0.007	-0.027	0.016	-0.160*	0.095	-0.000	0.065
	(0.033)	(0.039)	(0.040)	(0.043)	(0.090)	(0.065)	(0.066)	(0.056)
no.Roma*treatment*post_2	-0.004	0.015	0.141*	-0.091	0.094	-0.058	0.025	-0.023
	(0.039)	(0.041)	(0.059)	(0.056)	(0.104)	(0.074)	(0.070)	(0.073)
no.Roma*treatment*post_3	-0.019	0.002	0.034	-0.033	0.102	-0.104*	0.004	-0.019
	(0.037)	(0.040)	(0.042)	(0.048)	(0.099)	(0.060)	(0.065)	(0.058)
no.Roma*treatment*post_4	-0.016	0.008	0.035	-0.02	0.121	-0.066	-0.007	-0.05
	(0.035)	(0.040)	(0.045)	(0.045)	(0.094)	(0.069)	(0.069)	(0.059)
No. observations	4167	4039	1951	2088	1005	1140	1009	885
ABSENCES								
treatment*post	-56.283	-86.799**	-105.188***	-69.135*	-202.805*	-114.608	-50.972	-20.640
	(37.331)	(34.779)	(35.008)	(39.464)	(102.579)	(68.565)	(53.117)	(56.768)
no.Roma*treatment*post_2	57.534	85.352**	177.351***	10.457	126.853	189.609**	15.556	-8.544
	(40.884)	(36.654)	(45.228)	(41.894)	(107.047)	(79.331)	(70.835)	(113.733)
no.Roma*treatment*post_3	59.873	96.056**	126.206***	67.658	188.665*	69.964	73.242	34.052
	(38.889)	(35.623)	(39.147)	(42.771)	(108.743)	(73.882)	(56.059)	(70.644)
no.Roma*treatment*post_4	42.908	77.140**	99.709***	56.312	197.019*	93.017	82.396	-77.249
	(38.645)	(36.359)	(35.929)	(41.663)	(106.602)	(73.063)	(56.186)	(61.571)
No. observations	3980	3868	1871	1997	945	1084	980	885

Standard errors in parentheses:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Intensity of average treatment by subgroups

	(1) all	(2) migrant	(3) no migrant	(4) late starter	(5) no late starter
MATHEMATICS					
treatment*post	0.521***	1.714***	0.275	0.510	0.548***
	(0.171)	(0.411)	(0.237)	(0.461)	(0.144)
no.Roma*treatment*post_2	-0.325*	-1.845***	-0.036	-0.228	-0.422**
	(0.190)	(0.533)	(0.250)	(0.528)	(0.167)
no.Roma*treatment*post_3	-0.500**	-1.559***	-0.265	-0.751	-0.446**
	(0.231)	(0.452)	(0.289)	(0.500)	(0.203)
no.Roma*treatment*post_4	-0.636***	-1.640***	-0.418	-0.479	-0.689***
	(0.190)	(0.445)	(0.252)	(0.499)	(0.177)
SERBIAN					
treatment*post	0.358	1.983***	0.009	0.894**	0.285
	(0.231)	(0.324)	(0.217)	(0.436)	(0.201)
no.Roma*treatment*post_2	-0.234	-1.972***	0.132	-0.695	-0.231
	(0.256)	(0.399)	(0.244)	(0.516)	(0.251)
no.Roma*treatment*post_3	-0.277	-1.578***	0.015	-0.961**	-0.137
	(0.271)	(0.360)	(0.264)	(0.448)	(0.236)
no.Roma*treatment*post_4	-0.467*	-1.963***	-0.133	-0.753	-0.452**
	(0.241)	(0.347)	(0.231)	(0.481)	(0.210)
AVERAGE					
treatment*post	0.396***	1.836***	0.067	0.664	0.390**
	(0.095)	(0.488)	(0.160)	(0.451)	(0.145)
no.Roma*treatment*post_2	-0.161	-2.188***	0.252	-0.386	-0.230
	(0.141)	(0.648)	(0.177)	(0.570)	(0.182)
no.Roma*treatment*post_3	-0.314	-1.442**	-0.018	-0.542	-0.283
	(0.193)	(0.563)	(0.239)	(0.533)	(0.196)
no.Roma*treatment*post_4	-0.410***	-1.605***	-0.112	-0.525	-0.437**
	(0.138)	(0.517)	(0.184)	(0.513)	(0.171)
No. observations	3961	591	3370	878	3083
INSUFFICIENT					
treatment*post	-0.137***	-0.292	-0.082***	-0.246*	-0.092**
	(0.036)	(0.207)	(0.025)	(0.136)	(0.040)
no.Roma*treatment*post_2	-0.002	0.571**	-0.110*	0.076	-0.019
	(0.069)	(0.278)	(0.063)	(0.229)	(0.057)
no.Roma*treatment*post_3	0.051	0.087	0.014	0.262	-0.020
	(0.082)	(0.243)	(0.078)	(0.186)	(0.071)
no.Roma*treatment*post_4	0.147**	0.207	0.109**	0.200	0.130**
	(0.059)	(0.218)	(0.050)	(0.180)	(0.053)
DROPOUT					
treatment*post	-0.007	-0.043	-0.001	0.079	-0.013
	(0.039)	(0.152)	(0.018)	(0.169)	(0.021)
no.Roma*treatment*post_2	0.015	0.233	-0.011	-0.036	0.013
	(0.041)	(0.170)	(0.024)	(0.181)	(0.021)
no.Roma*treatment*post_3	0.002	0.001	0.001	-0.077	0.005
	(0.040)	(0.153)	(0.022)	(0.174)	(0.025)
no.Roma*treatment*post_4	0.008	0.033	0.004	-0.077	0.011
	(0.040)	(0.153)	(0.022)	(0.176)	(0.025)
No. observations	4039	615	3424	905	3134
ABSENCES					
treatment*post	-86.799**	-298.926***	-27.393	-232.652***	-51.766
	(34.779)	(94.120)	(23.535)	(68.128)	(33.304)
no.Roma*treatment*post_2	85.352**	481.240***	2.247	260.127***	54.448
	(36.654)	(137.503)	(28.152)	(77.132)	(35.658)
no.Roma*treatment*post_3	96.056**	265.233***	44.936	312.349***	41.565
	(35.623)	(97.551)	(27.328)	(78.981)	(34.237)
no.Roma*treatment*post_4	77.140**	289.510***	18.310	212.908**	40.988
	(36.359)	(100.346)	(25.927)	(84.849)	(34.373)
No. observations	3868	576	3492	853	3015

Standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Cohort regression - A

MATHEMATICS	without controls			with controls			female			male		
	T	C	ALL	T	C	ALL	T	C	ALL	T	C	ALL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
young	0.108	0.172	0.213	-0.141	-0.104	-0.077	-0.141	-0.063	-0.105	-0.119	-0.161	-0.043
	(0.146)	(0.127)	(0.152)	(0.150)	(0.145)	(0.132)	(0.134)	(0.224)	(0.215)	(0.251)	(0.230)	(0.171)
post	0.060	0.121*	0.162	0.083	0.106	0.132**	0.116**	0.165*	0.190**	0.067	0.072	0.098*
	(0.048)	(0.061)	(0.103)	(0.050)	(0.062)	(0.054)	(0.049)	(0.087)	(0.071)	(0.070)	(0.062)	(0.058)
young*post	0.070	-0.324**	-0.365**	0.082	-0.241	-0.291*	-0.019	-0.344	-0.426*	0.180	-0.205	-0.239*
	(0.131)	(0.147)	(0.177)	(0.116)	(0.143)	(0.152)	(0.132)	(0.234)	(0.241)	(0.155)	(0.142)	(0.135)
treatment*post			-0.127			-0.059			-0.080			-0.045
			(0.145)			(0.074)			(0.088)			(0.086)
young*treatment			-0.131			-0.102			-0.041			-0.157
			(0.241)			(0.198)			(0.240)			(0.250)
young*post*treatment			0.460*			0.381*			0.428			0.412*
			(0.235)			(0.194)			(0.279)			(0.207)
SERBIAN												
young	0.173	0.290***	0.340***	-0.073	-0.011	0.035	-0.175	-0.035	-0.060	0.040	0.004	0.130
	(0.110)	(0.078)	(0.087)	(0.118)	(0.154)	(0.119)	(0.117)	(0.160)	(0.145)	(0.192)	(0.278)	(0.202)
post	0.047	0.123**	0.173	0.051	0.077	0.118**	0.037	0.104	0.159**	0.082	0.079	0.106**
	(0.053)	(0.056)	(0.110)	(0.056)	(0.050)	(0.045)	(0.051)	(0.072)	(0.063)	(0.081)	(0.049)	(0.041)
young*post	0.058	-0.391***	-0.441***	0.079	-0.255**	-0.300***	0.052	-0.284	-0.352**	0.101	-0.295*	-0.328**
	(0.115)	(0.109)	(0.152)	(0.102)	(0.104)	(0.101)	(0.113)	(0.173)	(0.170)	(0.161)	(0.154)	(0.139)
treatment*post			-0.158			-0.079			-0.131			-0.043
			(0.154)			(0.074)			(0.086)			(0.086)
young*treatment			-0.199			-0.147			-0.123			-0.168
			(0.167)			(0.138)			(0.154)			(0.222)
young*post*treatment			0.531**			0.382**			0.416*			0.423*
			(0.212)			(0.149)			(0.215)			(0.212)
AVERAGE												
young	-0.355**	-0.375***	-0.262*	-0.671***	-0.652***	-0.643***	-0.753***	-0.764***	-0.798***	-0.576**	-0.549**	-0.494***
	(0.140)	(0.112)	(0.147)	(0.150)	(0.150)	(0.126)	(0.142)	(0.195)	(0.180)	(0.241)	(0.211)	(0.152)
post	0.133*	0.109**	0.222**	0.151*	0.107	0.122**	0.141**	0.167	0.164**	0.182	0.077	0.105*
	(0.065)	(0.046)	(0.105)	(0.075)	(0.067)	(0.049)	(0.063)	(0.107)	(0.069)	(0.110)	(0.064)	(0.061)
young*post	0.016	-0.327**	-0.441**	0.051	-0.256	-0.287*	-0.014	-0.308	-0.366	0.108	-0.274*	-0.293*
	(0.150)	(0.149)	(0.184)	(0.137)	(0.158)	(0.156)	(0.127)	(0.235)	(0.230)	(0.193)	(0.154)	(0.147)
treatment*post			-0.159			0.021			-0.029			0.062
			(0.163)			(0.088)			(0.094)			(0.117)
young*treatment			-0.163			-0.043			0.031			-0.105
			(0.239)			(0.179)			(0.192)			(0.242)
young*post*treatment			0.527**			0.339			0.369			0.390
			(0.247)			(0.210)			(0.265)			(0.239)
No. observations	2462	1624	4086	2395	1567	3962	1180	736	1916	1215	831	2046

Standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Cohort regression - B

INSUFFICIENT	without controls			with controls			female			male		
	T	C	ALL	T	C	ALL	T	C	ALL	T	C	ALL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
young	0.207***	0.238***	0.201***	0.284***	0.236***	0.266***	0.281***	0.257***	0.288***	0.280***	0.211**	0.240***
	(0.061)	(0.050)	(0.054)	(0.065)	(0.043)	(0.046)	(0.049)	(0.080)	(0.084)	(0.097)	(0.081)	(0.059)
post	-0.083***	-0.032	-0.069**	-0.071**	-0.045	-0.039*	-0.055*	-0.083**	-0.054*	-0.094**	-0.019	-0.029
	(0.028)	(0.024)	(0.028)	(0.031)	(0.033)	(0.022)	(0.028)	(0.033)	(0.029)	(0.045)	(0.045)	(0.032)
young*post	0.024	0.021	0.058	-0.003	0.028	0.011	0.067	0.051	0.036	-0.068	0.020	0.003
	(0.054)	(0.071)	(0.075)	(0.052)	(0.068)	(0.067)	(0.063)	(0.111)	(0.100)	(0.063)	(0.081)	(0.084)
treatment*post			0.009			-0.031			-0.002			-0.058
			(0.030)			(0.039)			(0.041)			(0.054)
young*treatment			0.030			-0.005			-0.024			0.016
			(0.079)			(0.077)			(0.098)			(0.097)
young*post*treatment			-0.057			-0.014			0.031			-0.074
			(0.082)			(0.088)			(0.119)			(0.109)
DROPOUT												
young	-0.020***	-0.014*	-0.012**	-0.002	0.011	0.002	-0.002	0.013	0.009	-0.005	0.008	-0.008
	(0.004)	(0.007)	(0.006)	(0.006)	(0.014)	(0.007)	(0.013)	(0.017)	(0.017)	(0.010)	(0.015)	(0.009)
post	0.003	-0.004	-0.002	0.015**	-0.002	-0.003	0.021*	-0.019	-0.016	0.009	0.010	0.007
	(0.006)	(0.006)	(0.007)	(0.006)	(0.010)	(0.006)	(0.010)	(0.012)	(0.010)	(0.009)	(0.015)	(0.014)
young*post	0.030**	0.080***	0.078***	0.014	0.079***	0.080***	0.031	0.071***	0.077***	-0.003	0.087***	0.083***
	(0.014)	(0.024)	(0.023)	(0.013)	(0.019)	(0.018)	(0.020)	(0.019)	(0.018)	(0.012)	(0.028)	(0.028)
treatment*post			0.005			0.018**			0.038**			0.003
			(0.009)			(0.009)			(0.015)			(0.016)
young*treatment			-0.009			0.005			-0.003			0.015
			(0.006)			(0.006)			(0.016)			(0.012)
young*post*treatment			-0.047*			-0.066***			-0.047*			-0.087***
			(0.027)			(0.022)			(0.027)			(0.029)
No. observations	2509	1658	4167	2438	1601	4039	1200	751	1951	1238	850	2088
ABSENCES												
young	-21.835***	-1.674	-0.141	3.123	37.687*	18.656	-8.373	39.502	26.379	12.221	32.323	8.644
	(6.679)	(14.939)	(13.725)	(8.355)	(20.554)	(17.503)	(11.240)	(23.527)	(21.174)	(14.033)	(23.473)	(17.397)
post	6.732	19.031**	20.564	10.022	30.724***	20.728**	7.655	21.190*	8.570	13.007	37.766***	30.488***
	(5.386)	(8.406)	(13.534)	(5.975)	(9.912)	(7.856)	(7.172)	(10.707)	(8.771)	(8.865)	(11.015)	(9.396)
young*post	37.800***	45.788*	44.255*	23.579*	57.493**	54.639**	40.707**	67.618**	67.603**	9.740	52.423**	49.480**
	(11.139)	(24.209)	(24.838)	(11.537)	(21.263)	(22.235)	(16.000)	(28.938)	(26.469)	(14.055)	(22.036)	(24.287)
treatment*post			-14.801			-10.409			-0.785			-17.036
			(18.481)			(10.354)			(11.898)			(12.891)
young*treatment			-22.663			-0.868			-19.597			16.848
			(17.445)			(16.384)			(19.622)			(16.766)
young*post*treatment			-5.487			-31.867			-28.524			-40.337
			(28.803)			(24.945)			(30.772)			(27.852)
No. observations	2394	1586	3980	2336	1532	3868	1152	719	1871	1184	813	1997

Standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Cohort regressions by subgroups - A

	all			migrant			no migrant		
	T	C	ALL	T	C	ALL	T	C	ALL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
MATHEMATICS									
young*post	0.082	-0.241	-0.291*	0.095	-1.328***	-1.280***	0.093	-0.005	-0.060
	(0.116)	(0.143)	(0.152)	(0.340)	(0.246)	(0.262)	(0.115)	(0.136)	(0.140)
young*post*treatment			0.381*			1.424***			0.168
			(0.194)			(0.425)			(0.182)
SERBIAN									
young*post	0.079	-0.255**	-0.300***	0.328	-1.209***	-1.141***	0.060	-0.032	-0.089
	(0.102)	(0.104)	(0.101)	(0.336)	(0.258)	(0.280)	(0.100)	(0.124)	(0.107)
young*post*treatment			0.382**			1.482***			0.157
			(0.149)			(0.417)			(0.146)
AVERAGE									
young*post	0.051	-0.256	-0.287*	-0.002	-1.207***	-1.183***	0.065	-0.024	-0.059
	(0.137)	(0.158)	(0.156)	(0.358)	(0.265)	(0.264)	(0.133)	(0.168)	(0.166)
young*post*treatment			0.339			1.210***			0.133
			(0.210)			(0.434)			(0.211)
No. observations	2395	1566	3961	299	292	591	2096	1274	3370
INSUFFICIENT									
young*post	-0.003	0.028	0.011	0.076	0.210*	0.205*	-0.012	-0.019	-0.038
	(0.052)	(0.068)	(0.067)	(0.190)	(0.105)	(0.105)	(0.047)	(0.071)	(0.071)
young*post*treatment			-0.014			-0.134			0.023
			(0.088)			(0.217)			(0.088)
DROPOUT									
young*post	0.014	0.079***	0.080***	-0.029	0.055	0.056	0.020	0.080***	0.082***
	(0.013)	(0.019)	(0.018)	(0.036)	(0.059)	(0.059)	(0.014)	(0.023)	(0.023)
young*post*treatment			-0.066***			-0.087			-0.064**
			(0.022)			(0.069)			(0.027)
No. observations	2438	1601	4039	311	304	615	2127	1297	3424
ABSENCES									
young*post	23.579*	57.493**	54.639**	-9.963	66.857	68.441	26.788**	50.431*	46.649*
	(11.537)	(21.263)	(22.235)	(40.296)	(67.480)	(66.753)	(11.412)	(23.996)	(24.361)
young*post*treatment			-31.867			-80.342			-22.217
			(24.945)			(77.954)			(26.872)
No. observations	2336	1532	3868	294	282	576	2042	1250	3292

Standard errors in parentheses:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Cohort regressions by subgroups - B

	all			late starter			no late starter		
	T	C	ALL	T	C	ALL	T	C	ALL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
MATHEMATICS									
young*post	0.082	-0.241	-0.291*	-0.218	0.055	-0.074	0.164	-0.198	-0.271
	(0.116)	(0.143)	(0.152)	(0.230)	(0.329)	(0.344)	(0.137)	(0.151)	(0.183)
young*post*treatment			0.381*			-0.138			0.447*
			(0.194)			(0.407)			(0.227)
SERBIAN									
young*post	0.079	-0.255**	-0.300***	0.177	-0.321	-0.412	0.101	-0.132	-0.213
	(0.102)	(0.104)	(0.101)	(0.184)	(0.327)	(0.290)	(0.130)	(0.125)	(0.135)
young*post*treatment			0.382**			0.563			0.317
			(0.149)			(0.341)			(0.189)
AVERAGE									
young*post	0.051	-0.256	-0.287*	-0.177	-0.181	-0.307	0.146	-0.158	-0.215
	(0.137)	(0.158)	(0.156)	(0.235)	(0.368)	(0.372)	(0.149)	(0.170)	(0.171)
young*post*treatment			0.339			0.100			0.368
			(0.210)			(0.451)			(0.227)
No. observations	2395	1566	3961	556	322	878	1839	1244	3083
INSUFFICIENT									
young*post	-0.003	0.028	0.011	0.084	0.041	0.049	-0.042	-0.004	-0.014
	(0.052)	(0.068)	(0.067)	(0.066)	(0.133)	(0.124)	(0.055)	(0.075)	(0.073)
young*post*treatment			-0.014			0.045			-0.027
			(0.088)			(0.146)			(0.091)
DROPOUT									
young*post	0.014	0.079***	0.080***	0.027	0.181**	0.160**	0.012	0.056***	0.059***
	(0.013)	(0.019)	(0.018)	(0.047)	(0.065)	(0.060)	(0.009)	(0.019)	(0.018)
young*post*treatment			-0.066***			-0.125			**-0.047****
			(0.022)			(0.075)			(0.020)
No. observations	2438	1601	4039	568	337	905	1870	1264	3134
ABSENCES									
young*post	23.579*	57.493**	54.639**	29.451	-23.600	-33.643	18.882	61.719***	63.210***
	(11.537)	(21.263)	(22.235)	(31.309)	(66.445)	(63.947)	(11.187)	(20.571)	(18.327)
young*post*treatment			-31.867			68.614			-44.595**
			(24.945)			(72.658)			(21.744)
No. observations	2336	1532	3868	545	308	853	1791	1224	3015

Standard errors in parentheses:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Location of the schools with assistants

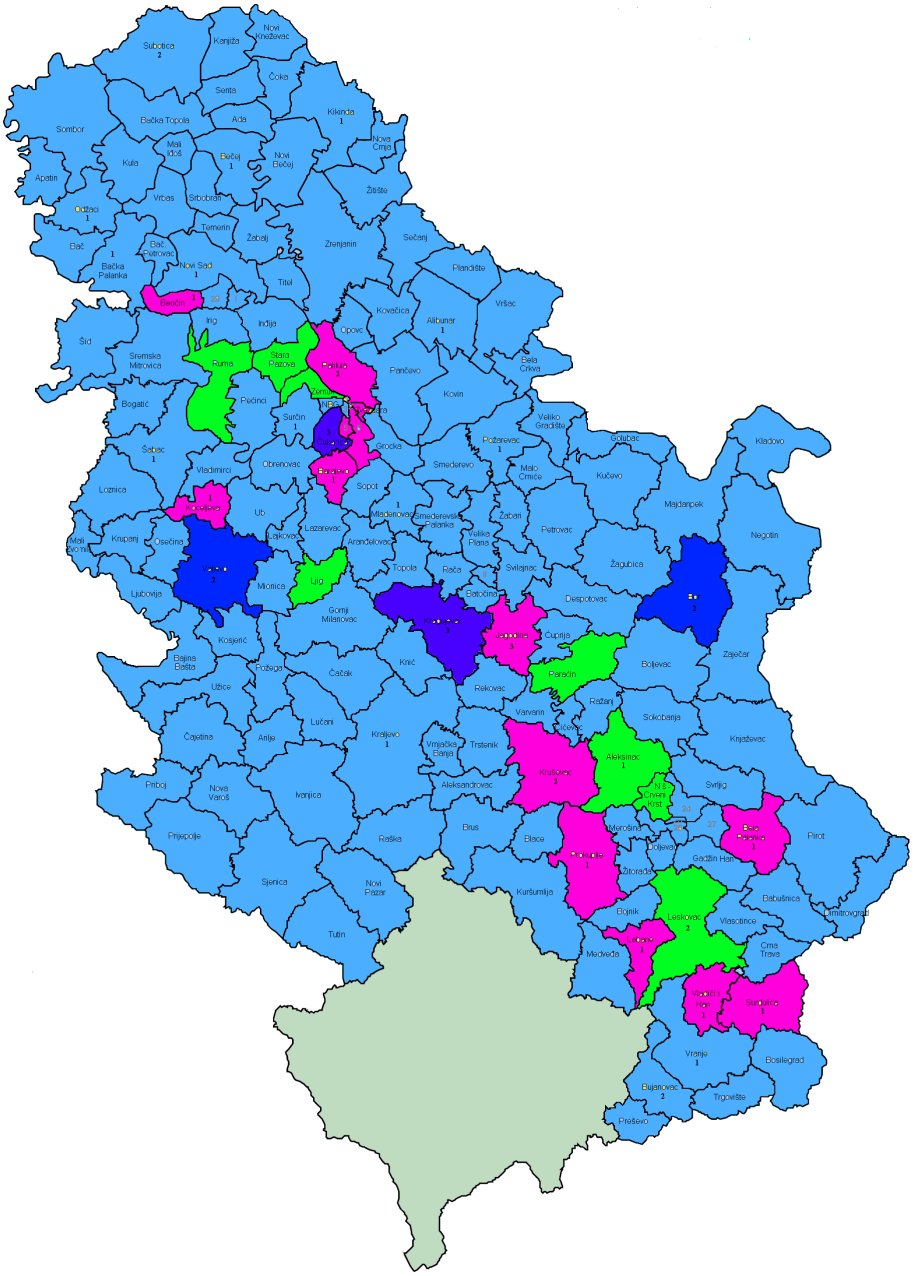
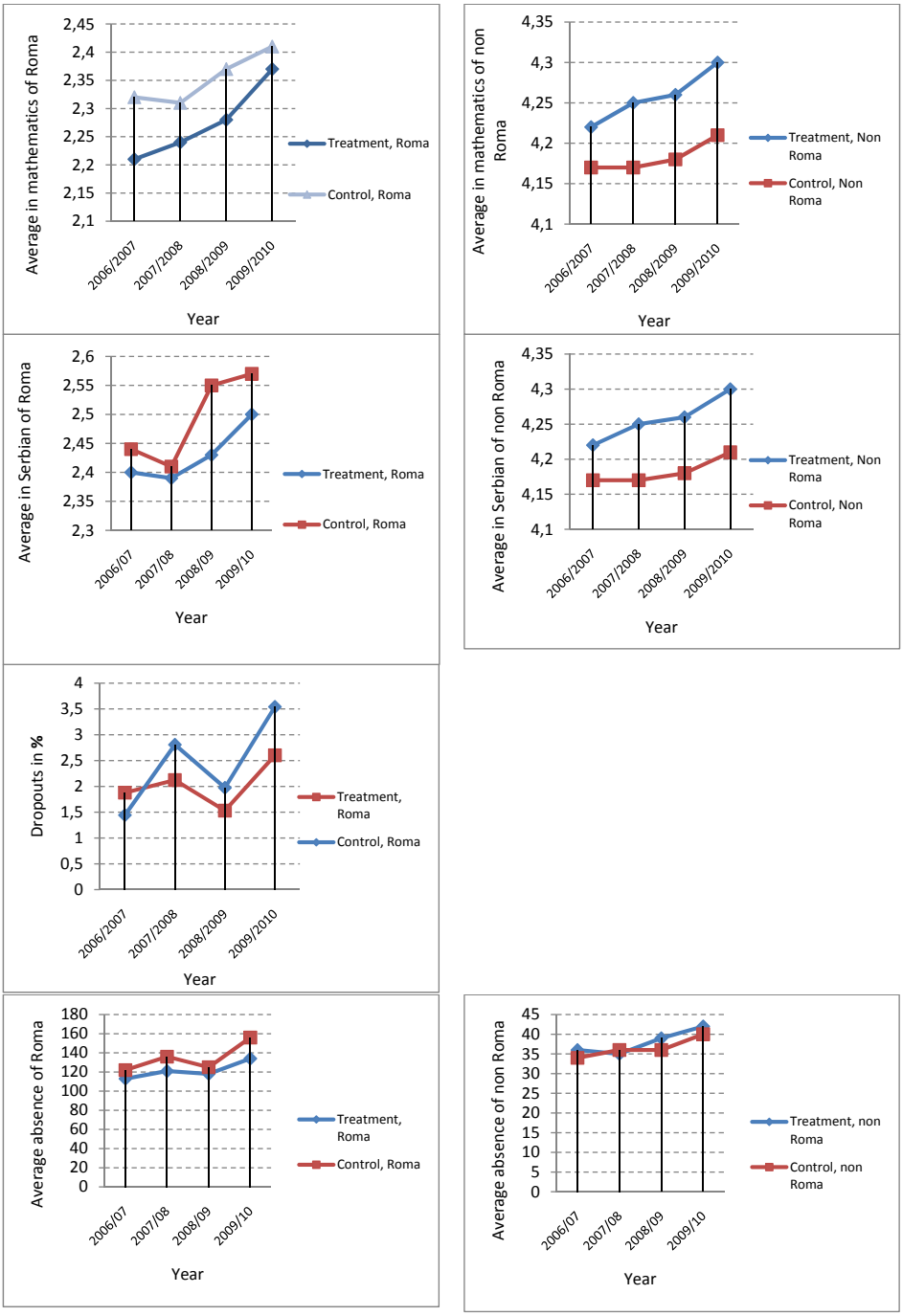


Figure 2: Trends of outcome variables for the four year period



Notes: Column 1 reports the outcomes of interest for Roma pupils; column 2 for non Roma pupils. In the first row trends for Mathematics over the years 2006-2010 are reported; in the second row for Serbian; in the third row for dropouts (in %) and in the last row for total absences.