

Ethno-Regional Favoritism and the Political Economy of School Test Scores

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HiCN Working Paper 322

February 2020

Abstract: The northern provinces of Burundi have suffered from an inferior education system since independence. This paper shows that the current, northern-led regime has chosen a drastic way to reverse that subordination. The national test (Concours National) at the end of primary school is at the heart of the matter. Using the universe of individual test score data which can be used to construct a school-level panel and applying difference- in-differences analysis, the paper shows strong improvements in test scores in northern versus southern schools since the ruling party won an absolute majority in the 2010 elections. Immediately after these elections, schools situated in very poor, rural areas in the north scored as high as schools in non-poor areas of the capital. The paper finds that increased success rates, improved mean test scores and decreased standard deviations are explained by the percent of votes at the municipality level obtained by the ruling party in the 2010 parliamentary elections. Controlling for school budget and cohort size variables does not change the results. The latter are interpreted in the political economy of education reform in Burundi and considered as a case of ethno-regional favoritism in Africa.

Keywords: ethno-regional favoritism, school test scores, elections, Burundi

Acknowledgements: This paper is a revised version of the Key Note Lecture the author delivered at the DIAL Development Conference held in Paris-Dauphine University on 2 -3 July 2015. Comments received at subsequent presentations at ECARES in Brussels, at CRED in Namur, at the Annual Workshop of the Households in Conflict Network in 2017, at the Wageningen Development Conference in April 2018, at UNU-MERIT in December 2018 and at WGAPE in Berlin in April 2019 allowed me to improve the paper substantially. I am grateful to Tilman Brück, Alice Mesnard, Pierre-Guillaume Méon, Alexandra Scacco, Francois Ryckx, Vijayendra Rao, Yasmine Bekkouche and Sarah Rosenberg. Any remaining errors are the author's responsibility only.

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1.Introduction

The African political landscape is populated by presidents who as rebel leaders have overthrown regimes and won power through post-war elections. The late Meles Zenawi in Ethiopia and Robert Mugabe in Zimbabwe, Yoweri Museveni in Uganda, Paul Kagame in Rwanda, Joseph Kabila in DRC and Pierre Nkurunziza in Burundi are but a few. The transformation of battle-hardened rebel leader to elected politician is not trivial. Rebel leaders spend many years fighting, used to a military environment and command structure, with a mind-set geared at enemies and adversaries, with blood on their hands and a group of (usually) loyal soldiers and officers. The latter want to see the rewards of their sacrifices. The new president thus needs to deliver, first and foremost for those who have helped him come to power. Typically, new leaders offer ministerial positions or directorships of government agencies to close collaborators and jobs in the army and security apparatus for former rebels. But how do new presidents secure the loyalty of (the part of) the population that supported his rebellion and brought him to power in the post-war election? Can the new president deliver on his war-time and campaign promises?

This paper studies the post-war behavior of one such rebel leader-turned-president, Pierre Nkurunziza of Burundi, in one particular domain – education – in order to contribute to our understanding of post-war political behavior. In Burundi, under post-colonial authoritarian regimes, the education sector has been geared towards serving the happy few. The Arusha Peace Agreement (2000) explicitly recognizes that inequality in education was one of the main causes of the civil war. The newly elected president, himself a teacher before he became a rebel leader, and originating from the province of Ngozi in northern Burundi, a long underserved region terms of education, professed to end that unequal situation.

In 2005, as one of his first acts in office, the president decided to abolish school fees in primary school, which caused a massive increase in enrolment. The school system was not prepared for the influx of students either in terms of infrastructure, the number of teachers or pedagogical material, but the decision made him very popular, in particular in the north where a significant number of children previously did not attend school or

dropped out early. Six years later, many children who were part of this new wave of students graduated from primary school and wanted to continue into secondary school.

Access to secondary school is decided upon merit via the Concours National, a nationwide competitive exam at the end of primary. However, the number of seats available in such schools is limited. The president was faced with the challenge of a large new cohort of northern students interested in accessing secondary schools, combined with the higher exam success rates of students in southern schools, given their longstanding advantage in education. Schools in the south have been the prime beneficiary of post-colonial education policies, in particular in the province of Bururi, home region of all post-colonial Tutsi presidents. Building new secondary schools would help to attack the problem but this requires money for new schools (priority was given in the budget to the primary level) as well as training new teachers, policies that also take time to materialize.

This paper shows that after the 2010 parliamentary elections, won by a landslide and resulting in uncontested power, test scores for the Concours National in schools in northern Burundi – home turf of president Nkurunziza and a region where his party did very well in the elections – went up dramatically. Changes in test scores from one year to the next in northern schools, and in particular in the province of Ngozi are so dramatic that they cannot be attributed to a sudden increase in the quality of teaching, improved infrastructure, a different learning style or a different selection of pupils into schools. The paper shows that school budgets and the changes therein are not responsible for the observed changes in the test scores either. Right after the elections, the performance of northern schools, situated in rural areas with 70% headcount poverty, match those of the best performing schools in the capital, with the latter situated in urban areas of 0% headcount poverty. These same schools in the north however did far worse right before the elections. Next to election results we also use the distance of each school to the municipality of birth of the president and find that the smaller this distance, the larger the improvements in the test scores.

These results do not bode well for Burundi, as it means that school test scores are subject to ethno-regional favoritism. In a political economy framework these findings can be interpreted as a reward to the president's supporters, or as a purchase of their loyalty to

the regime to position himself for the next election. The findings are also compatible with – and to some extent the logical consequence of – the pressure on the government to open up access to secondary school as a result of the 2005 decision to abolish school fees in primary school. The cohorts of pupils who benefited from that decision wished to continue to secondary school 5-6 years later, until then a privilege in Burundi. In order to respond to the aspirations from these pupils and their parents, many from the north, the president needed to increase access to secondary school.

Political interference in the school system taking the form of ethnic favoritism is not an invention of the inner circle around Pierre Nkurunziza. In at least one other episode of Burundese history, the national exam has been the object of political manipulation: under the regime of president Bagaza, who ruled Burundi from 1976 to 1987. In the period between 1980 and 1987, after Bagaza had expelled European missionaries from Catholic schools and turned these schools into public ones, he made sure that exam copies from Tutsi pupils were marked with an ‘i’ and those of Hutu pupils with an ‘h’. This allowed correctors to discriminate their grading in favor of Tutsi pupils. If Bagaza could do it, why not Nkurunziza?

The paper contributes to the literature on the political economy of power consolidation after war, ethno-regional favoritism and political interference in education in the following ways: (i) it shows that an elected government, eager to please its supporters and driven by its own promises and past decisions interfered in crucial administrative processes to forge a politically desired outcome; (ii) it demonstrates how such government perverted what was in essence a meritocratic institution – in this case a school system and its competitive exam – that educates, trains and forms the countries’ future generation; (iii) it also shows that historic inequities and past grievances that remain unaddressed can lead to manipulative behavior by the new power elite, eager to reverse rather than undo discrimination.

This paper uses administrative data on pupil performance. Such data have several advantages: their structure allows the researcher to understand the functioning of a governmental agency, department or ministry. In comparison to household surveys,

administrative data sources usually have much fewer variables per person, but the advantage is that it often encompasses the quasi-totality of the population under study.

The paper is structured as follows: after a review of the literature we first document the inequality in access to secondary education and describe the political, ethnic and regional issues that have governed Burundi's education system. In section four we document the changes in success rates, average points obtained and standard deviations for the Concours National over the years for which we have data. We then present our main result, starting with the positive correlation between increases in success rates on the one hand and the proximity to the municipality of origin of the president, as well as the correlation with the percentage of votes for the party of the president in the 2010 parliamentary elections. We also show that before 2010 there was no such correlation. We cement our finding with a difference-in-differences analysis and with the estimation of several models for dynamic panel data with large N and small T. We interpret our findings in the political economy of education in Burundi and discuss the mechanisms at work.

2. Theoretical background and existing evidence

Why would ethnic favoritism happen? Frank and Rainer (2012) distinguish several models to describe the relationship between a political leader and the members of his ethnic group. The first is the model assumes that the political leader derives direct utility from his ethnic group's higher level of well-being. The implication of this model is straightforward: the ethnic leader will be interested in providing favors to the members of his group, regardless of their actual political behavior. The leader is thus assumed to have altruistic preferences toward his ethnic group. The second model assumes that the political leader is purely an office-seeker in need of political support. The members of the leader's ethnic group will only support him in exchange for material benefits such as schools or hospitals. This can be termed the "quid pro quo" model, because it involves a mutual exchange of support between the ethnic leader and the ordinary members of his group.¹

¹ In a variant on this model, the members of the leader's ethnic group derive psychic benefits from seeing their leader in power (Chandra 2004). This implies that members will support their co-ethnic leader unconditionally,

These models lead to predictions for the behavior of political leaders and their co-ethnics in ethnically heterogeneous societies. If, for example, the leader manages to extract vast amounts of wealth from the country's natural resources such as oil or diamonds and uses the wealth generated to satisfy a narrow elite that can ensure his survival in office, he may not need, or indeed may not be interested in providing material benefits to ordinary members of his ethnic group (Bueno de Mesquita et al. 2003). In contrast, in a society where the leader actively seeks the support of a broad group of people and tries to mobilize them via a mass political party, the "quid pro quo" strategy is much more likely to emerge (Wintrobe, 1998). An extreme application of the "quid pro quo" model of ethnic favoritism is described by Verwimp (2013) on the mechanisms at work in the Rwandan genocide: Hutu farmers were told that they could keep the property of their Tutsi neighbors if they would first help exterminate them. This was the stated policy of the ethnic leaders at the time to secure their own survival in office.

Since the surge of empirical work in economics more than a decade ago, a great deal of research combines a political economy framework with micro-data to test human behavior. A growing literature looks at the preferential treatment by politicians of members of their own region or own ethnicity. Some studies focus on the effects of belonging to the same ethnic group as the top political leaders (Kramon and Posner, 2012; Kudamatsu, 2009), while others use regionally based measures, considering the effects of living in the ethnic homelands of the political leadership (Burgess et al., 2015; Hodler and Raschky, 2010; Kasara, 2007).

Using DHS data from 18 African countries and a difference-in-difference approach, Franck and Rainer (2012) find that a co-ethnic leader on average increased the primary school attendance, completion and literacy of their ethnic groups by about 2 percentage points and reduced their infant mortality by about 0.4 percentage points. Looking at electricity using a large and diverse sample of 140 multiethnic countries from 1992 to 2013 and controlling for country-year fixed effects, Luca et al. (2018) finds that a co-ethnic leader translated into 7-10% more intense nighttime light, as measured by the National

without demanding any material benefits in return, which would make it unlikely that they receive benefits from their leader. Hence the predictions of this model are inconsistent with ethnic favoritism.

Oceanic and Atmospheric Administration (NOAA). In a separate paper Dickens (2018) arrives at very similar results.

Burgess et al. (2015) provide evidence that democratization affects ethnic favoritism in Kenya. Across the 1963-2011 period, districts that share the ethnicity of the president receive twice as much expenditure on roads and have five times the length of paved roads built, but this favoritism disappears during periods of democratic governance. Ejdemyr, Kramon and Robinson (2017) contribute to an explanation of such findings by pointing at ethno-regional segregation: when ethnic groups are geographically segregated, elites are able to aid co-ethnics with the targeted provision of public goods, while ethnic integration forces elites to resort to less efficient private transfers. Using detailed information on the spatial distribution of ethnic groups, they find that over 1998-2008, more geographically segregated ethnic groups are more likely to receive new public goods (boreholes, clinics and schools) with a co-ethnic leader while less segregated groups are more likely to receive transfers (such as coupons that subsidize the cost of fertilizer and other agricultural inputs). Relatedly, in Mexico, Diaz-Cayeros, Estévez and Magaloni (2017) find that core voters are targeted with private benefits to retain their loyalty, while other voter groups will be favored with public goods when the party's loyal base is insufficient to win elections. For a review and classification of the literature on distributive politics and clarification of key terms, we refer to Golden and Min (2013).

Expanding on Franck and Rainer (2012), Kramon and Posner (2013) focus on four outcomes in six African countries: infant survival, educational attainment, access to improved water sources, and household electrification. They find that the evidence of ethnic favoritism is outcome-specific, often finding evidence of favoritism for one outcome in a country but not in the others. Dreher et al (2015) collected data on the birth place of 117 African leaders and geocoded 1650 Chinese development finance projects across 3097 locations in the 2000-12 period. They found that birth regions receive substantially more funding from China when leaders are in power compared to other subnational regions. The authors did not find this correlation for World Bank-funded projects.

Ahlerup and Issakson (2015) propose to distinguish between ethnic and regional favoritism. The close connection made between ethnic and regional favoritism rests on the

assumption that, in the African context, the region and ethnic identity of inhabitants tend to coincide for historical reasons. When discussing the particularities of Burundi's political economy, we will return to this nuance.

When all pupils from schools in entire municipalities or in entire provinces benefit from grade inflation, and this appears not to be the case in other municipalities and provinces, then something more is going on than bribery of individual teachers or examiners. The latter is a widespread and documented practice in countries such as Romania (Bocan et al, 2017), Brazil (Ferraz et al, 2012) or Bangladesh (Chloe et al, 2013) where, depending on the context, corruption can lead to worse test scores or to artificially high test scores.

3. Ethno-regional Favoritism and the Politics of Education in Burundi

(a) A Political Timeline

The paper concentrates on the 2010-2012 period, which marks the first half of the second term of President Nkurunziza. In 2005 his party, the Conseil National pour la Défense de la Démocratie, had won the post-war elections and formed a coalition government in keeping with the Arusha Peace Agreement, which required proportional representation of ethnic, social and regional groups at the executive level (president, vice-presidents, ministers), parliament, the judiciary and the army. The 2005 election marked the end of the most bloody period in Burundese history known as '*la crise*', which started in October 1993 with the murder of Melchior Ndadaye, the first Hutu ever elected as president, by the then Tutsi-controlled army (see Figure 1).

The newly elected president was murdered because he sought to reverse longstanding discrimination of Hutu in the administration, the army, and in education. As we have seen under President Bagaza and as we will discuss below under President Nkurunziza, the education sector is often the object of political interference once a new regime assumes power. When Ndadaye came to power, he decided to suspend the ongoing scholarships for study abroad of Tutsi students, thereby jeopardizing the study trajectory of the educational elite. The fight for the control of scholarships to study abroad returned under Nkurunziza, whose administration wanted to decide themselves whom to send abroad on

donor-funded scholarships, which donors until then had decided on a merit basis. The same storyline occurred in the naming of new university assistants, a privileged position at the National University in Bujumbura where such assistantships were also given on a merit basis. The government of Nkurunziza decided to overrule the nominations for such assistantships and promoted its own loyalists to these positions. The politization of the national university with political appointees in the highest echelons is another example of political interference in the education sector.²

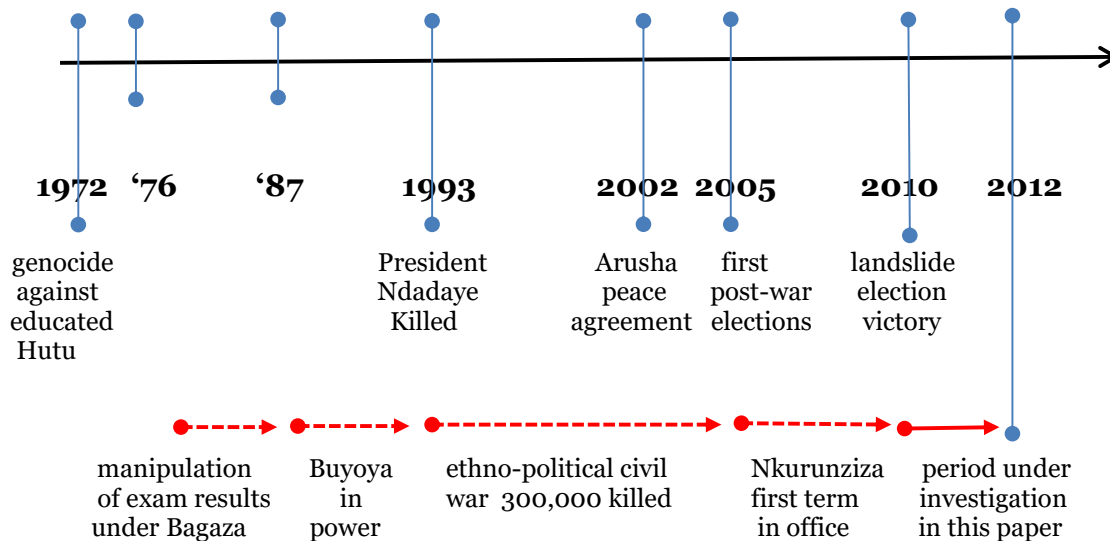
Reversal of discrimination is one thing, but the magnitude and intensity of the violence that has been perpetrated in Burundese history also leaves deeper, personal wounds. President Nkurunziza, and many Hutu with him, lost his father during the 1972 genocide. His father was then a member of parliament who was killed by the Tutsi-controlled army. Before becoming a rebel leader, Pierre Nkurunziza was a teacher. He is thus very familiar with the impact of politics on education, from a personal as well as from a professional point of view. He personifies a generation that has suffered a lot from the Tutsi dictatorships, both personally and within their families as well as in terms of education, job and welfare prospects. The 1972 genocide, which is the point of reference for Nkurunziza's generation, represents in itself the importance of education and of violence: President Micombero (1965-1976) murdered all educated Hutu, including students and pupils, because he believed they were a threat to his regime, with an estimated death toll of 200,000.

Together with other rebel leaders Nkurunziza started a Hutu rebellion in 1994 to combat the Tutsi army. The first few years of the civil war were characterized by ethnic cleansing in parts of the capital, boycotts of the regime by the international community, mass displacement of the population and the establishment of camps within the country, to protect the Tutsi population as well as control the Hutu population. Cracks in the Hutu leadership led to the formation of rebel factions with their own agendas. Nkurunziza's party, who in 2005 won the elections, did not take part in the Arusha Peace Negotiations and did not sign the peace agreement. The latter stipulates a guaranteed representation of

² The political interference in the attribution of scholarships, in the nomination of university assistants and university administration is common knowledge for persons working in Burundi at the time. During his many visits to Burundi, the author received confirmation from unrelated sources for these practices.

all social, ethnic and regional divisions in Burundese society. During his two terms in office, Nkurunziza and his party would try to undo the stipulations of the peace agreement.

Figure 1: a political timeline



In his first term in office, the party of the president shared power with other political parties in a coalition government even though CNDD-FDD has won 59 of the 100 seats in the Chamber of Representatives. The party occupied 11 out of the 20 ministries as well as one of the two vice-presidencies. The constitution, which enshrines ethnically-based power-sharing, requires that 60% of ministers come from the Hutu majority while the remaining 40% come from the Tutsi minority. At least 30% of government ministers must be women. The Minister of Education during the first term was Saïdi Kibeya, a Hutu from the southern province of Bururi who belonged to CNDD-FDD. The first term was considered a moderate success by most observers: the economy showed a slight positive trend after many years of civil war and the population enjoyed long-desired peace and stability. In the social sector, in addition to abolishing school fees for primary education the president also abolished health fees for pregnant women and children under five. Both decisions were met with great enthusiasm by the population.

In his second term, the party of the president obtained a landslide victory. CNDD-FDD then had 81 out of the 106 seats in the Chamber of Representatives and occupied 16 out of 22 Ministries. In the period under investigation, two men served as Minister in charge of primary education. The first was Ernest Mberamiheto, serving in 2009 and 2010, a native of the province of Kirundo. He was Hutu and did not belong to the party of the president. He was a former teacher and commune administrator in Gisagara, province of Cankuzo. The second, Séverin Buzingo, who served in 2011 and 2012, originated from the province of Cankuzo as well. He was Tutsi and member of the party of the president. On 18 October 2012, at the occasion of a school opening ceremony in the province, he declared:

*“Many children of Gatete Hill [Cankuzo province] were not attending school because of the long distances. I also had to walk for 30 miles a day to go to school when still in primary school, going hungry and sometimes sick because of tiredness. It’s obvious that many children were forced to stay home because of lack of schools here on this hill. The proof is that more than five years ago when community members built two classrooms here, only around 100 children attended this school, but with the opening of this new school, over 250 children joined; where were they before? At home. Thanks to World Vision and the donor, now they can study”.*³

The two post-2010 ministers share with Nkurunziza a strong affiliation with the education sector, the first as a teacher, the second as a victim of underinvestment in his region when he was a child. We come back to the significance of the ministers below.

(b) The place of the Concours National within the education system

Until 2013, Burundi had six years of primary schooling followed by three years of junior secondary school and then a choice between senior secondary school and technical/professional education. As very few children attend kindergarten, the first years of primary school serve to acquaint pupils with the school system. Pupils start primary school between the ages of 6 and 10. There is a high rate of drop-out. Those who complete primary schooling are anywhere between 12 and 18 years old. It is common to have pupils of very different ages in the same grade and the same classroom. The repetition of grades in primary school is a widespread phenomenon, in particular in grades 5 and 6. The first four grades are taught in Kirundi, Burundi’s national language. In the 5th grade, all topics

³ Citation from press release by World Vision, <https://www.wvi.org/es/node/971>, retrieved on October 7, 2019.

are taught in French, causing a lot of difficulty for many pupils, resulting in high rates of repetition of the 5th grade. At the end of the 6th grade, the Ministry of Education organizes a national test, the Concours National. Those who fail the test are allowed to re-take it a year later, resulting in repetition of the 6th grade. The Concours National consists of 4 topics, each weighted differently. The two most important are French and Mathematics, respectively given 80 and 70 points, followed by Kirundi and Environmental Science (a mix of biology and geography), with respectively 30 and 20 points. A pupil can obtain a maximum of 200 points.

Each year, the Ministry of Education sets a threshold depending on the number of seats available in the country's secondary school system. Before the start of the civil war, this number was around 3,000 per year, though about 50,000 students typically competed annually during this period for the chance to attend a "lycée," as secondary schools are called. This was a very competitive and merit-based system in which only a select few would attend secondary school.

Dunlop (2015) who interviewed Hutu and Tutsi adults on their school career for her MA thesis, writes that the Concours National favored Tutsi pupils because the latter were better prepared for the exam in better-funded schools. The 'objective' outcome of the exam made Tutsi pupils believe that Hutu were not interested in pursuing secondary education and preferred to stay on the farm. One of her interviewees puts it as follows:

"We didn't realize the barriers they [Hutu] had at the time in order to get to secondary school or to learn important things that would get them far in life, like math or science or economics. We thought they were choosing this [poverty, rural farm life], when it was just a lot harder for them [to move on to secondary school]." (Dunlop, 2015, p.94)

This description of how Hutu were perceived is telling, Dunlop writes, as the interviewee offers insight into the ramifications of the national exams on the consciousness of Burundians. In saying that he believed they "were choosing this", he implies that in later years, there were not a lot of Hutu going to school and there was a perception that Hutu did not want to go to school. He also acknowledges that, looking back on it, there were significant barriers in place for Hutu that he just didn't realize at the time.

Because of growing demand for secondary schooling and such a high number of pupils who could not continue their studies, Burundi started a second-tier system at the turn of the millenium, called ‘collège communal,’ in which pupils would be granted a seat when they scored below the (very high) threshold for the Lycée, but above a second, lower threshold. Until 2013, this two-tier double threshold system was in place.

Table 1 allows a better understanding of what this system means for the average pupil. In 2010, 188,000 pupils participated in the Concours National. They were on average 16 years old and the average test score was 64/200. As there were 3,300 seats available in the Lycées, only the top 1.7% (3,300/188,000) were able to access a Lycée. The Ministry of Education set the first threshold at 128/200 in order to give 3,300 students access to a Lycée. The collèges communaux that year had another 35,000 seats available. Accordingly the Ministry set the second threshold at 81/200. Pupils scoring below 81 could either try again next year, quit school, or go to a private school. In 2011 and 2012 more pupils participated in the test and more seats were available thanks to newly built schools. The success rates were also higher compared to 2010. The test in 2011 was more difficult, hence the threshold was set lower than the year before, whereas the test in 2012 was much easier, hence the threshold was set much higher.

Table 1: Key indicators for test scores by year of the test

| Indicator | Year of the test | 2010 | 2011 | 2012 |
|--------------------------------------------|------------------|---------|---------|---------|
| Number of participants | | 188,573 | 201,239 | 221,606 |
| Average score (max is 200) | | 70.5 | 63.0 | 125.7 |
| Standard Deviation | | 25.6 | 23.11 | 26.0 |
| Minimum threshold for the Lycée | | 128 | 118 | 161 |
| Minimum threshold for the collège communal | | 81 | 68 | 127 |
| % of participants succeeded | | 33% | 38% | 49% |

(*) excluding pupils who enrolled for the test but did not show up (5%)

(c) Inequality today

This merit-based system creates inequality as all pupils compete with one another for the available seats. A pupil from a poor, rural commune has to compete with a pupil from a rich, urban area. As a result, pupils from the capital Bujumbura are over-represented (compared to the number participating) among those who win access to the Lycée whereas pupils from several poor, rural provinces are much under-represented. This can be observed from Table 2 and Figures 1 and 2, with data based on the 2010 national test. In addition, southern municipalities have higher success rates and are overrepresented relative to the number of participants in the exam. A representation around 1 or -1 is in line with the number of participants in the province. The capital comes out as strongly over-represented and 4 provinces as strongly under-represented (Kayanza, Cibitoke, Kirundo and Karuzi). The latter are all northern provinces.

Table 2: Participation and Success Rate per Province, 2010

| Province | N of participants | Success rate | % in Lycee |
|-------------------|-------------------|--------------|------------|
| Bujumbura-Capital | 12147 | 44,32 | 6,94 |
| Makamba | 10301 | 43,98 | 1,89 |
| Muyinga | 10051 | 39,41 | 2,18 |
| Bururi | 18811 | 38,38 | 1,4 |
| Bubanza | 7621 | 35,7 | 1,49 |
| Cankuzo | 5148 | 35,62 | 1,74 |
| Ngozi | 11163 | 35,61 | 1,25 |
| Mwaro | 9407 | 35,32 | 1,16 |
| Bujumbura-Rural | 16726 | 34,84 | 1,48 |
| Rutana | 8568 | 33,09 | 1,61 |
| Gitega | 20283 | 32,86 | 1,71 |
| Ruyigi | 8198 | 32,58 | 1,29 |
| Muramvya | 10352 | 32,38 | 1,11 |
| Kirundo | 10488 | 29,84 | 0,84 |
| Kayanza | 14788 | 29,26 | 0,61 |
| Karuzi | 11677 | 26,59 | 0,87 |
| Cibitoke | 10756 | 26,32 | 0,87 |

This inequality in terms of under- and overrepresentation also exists within the capital. Table 3 shows that the three top-performing urban municipalities (in terms of the success rate in the Concours National – access to the Lycée), Rohero, Kinindo and Nyakabiga, had a success rate of 15% or more. The three worst-performing urban municipalities, with a success rate lower than 1%, are Buterere, Kinama and Mubone. It is clear from these

Figure 2: Over- and Underrepresentation, 2010

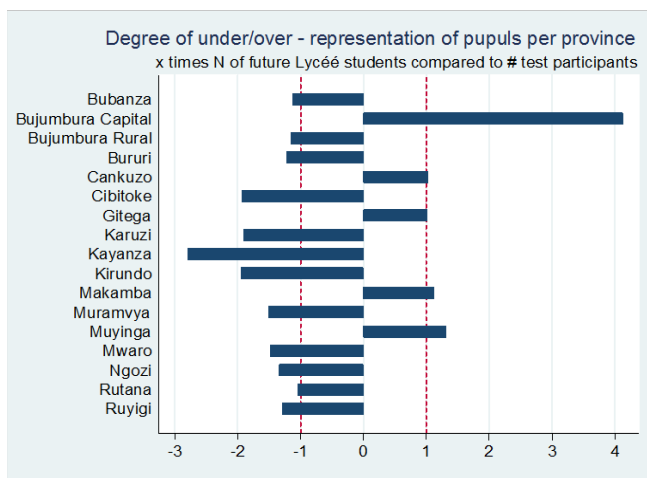
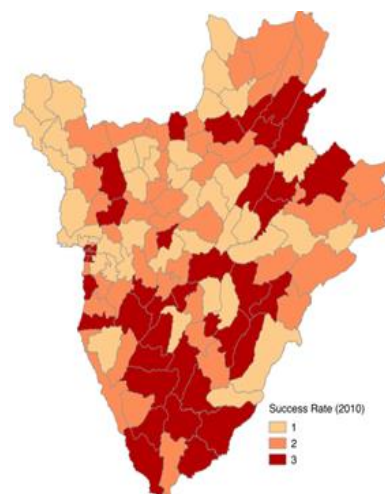


Figure 3: Success Rates, 2010



figures that the inequality in the capital with respect to test results is very large, with municipality of residence an important determinant. The average test score in Kinindo is twice that of Mubone. As a whole, students from the capital take 25% (N=844) of the available seats in the Lycée, whereas they represent only 6% of the number of pupils participating in the exam.

Comparing the top-performing municipalities of the capital on a national level with the worst performing province, we notice that 450 (55%) of the 844 students who succeed in the exam in the capital come from the three top-performing municipalities. Thus, whereas together these three account for only 2950 (1.6%) participants in the country, they deliver 13.6% (450/3307) of the future Lycée students, an 8.5-fold over-representation. The

province of Kayanza on the other hand accounts for 7.5% of the participants in the exam, but delivers only 91 (2.7%) of the future Lycée students, a 2.7-fold underrepresentation.

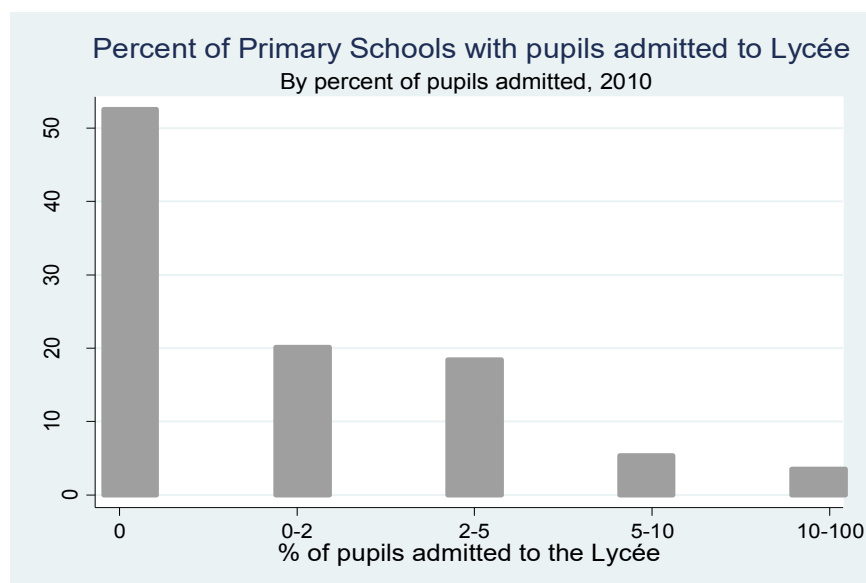
Another way of looking at inequality of test scores is at the school level. Figure 4 is particularly revealing. In 2010, 50% of Burundi's Primary Schools did not have a single pupil making the first threshold (for access to the Lycée) and 3% of the schools have more than 10% of their pupils accepted with the top schools and have all their pupils succeeding the second threshold in the Concours National.

Table 3: Key figures for the Capital Bujumbura, by Municipality

| Municipality | Participants in the exam | | | participants accepted for entry in a Lycée | | |
|--------------|--------------------------|---------------|---------------|--------------------------------------------|---------------|----------------------|
| | N | in % of total | Average Score | N | in % of total | in % of part./Munic. |
| Buterere | 419 | 3.9 | 52.52 | 3 | .35 | .71 |
| Buyenzi | 759 | 7.1 | 65.20 | 22 | 2.60 | 2.9 |
| Bwiza | 260 | 2.4 | 77.39 | 22 | 2.60 | 8.4 |
| Cibitoke | 497 | 4.6 | 52.57 | 7 | .82 | 1.40 |
| Gihosha | 1,225 | 11.5 | 76.41 | 143 | 16.94 | 11.67 |
| Kamenge | 551 | 5.2 | 78.10 | 29 | 3.43 | 5.2 |
| Kanyosha | 1,422 | 13.4 | 76.02 | 40 | 4.73 | 2.8 |
| Kinama | 991 | 9.3 | 55.24 | 5 | .59 | .50 |
| Kinindo | 424 | 4.0 | 97.82 | 71 | 8.41 | 16.74 |
| Mubone | 129 | 1.2 | 47.93 | 0 | 0 | 0 |
| Musaga | 941 | 8.9 | 83.21 | 99 | 11.72 | 10.52 |
| Ngagara | 1,185 | 11.2 | 76.81 | 72 | 8.53 | 6.07 |
| Nyakabiga | 511 | 4.8 | 83.95 | 76 | 9.0 | 14.87 |
| Rohero | 1,263 | 11.9 | 92.81 | 241 | 28.55 | 19.08 |
| Total* | 10,577 | 100 | 75.1 | 830 | 100 | 7.8 |

* For 1079 participants in the capital we were not able to find the commune. 14 of them succeeded, a number too small to bias our description.

Figure 4



4. Description of the Data and Preliminary Observations

(a) Data Description and Difference-in-Differences

For success rates in the Concours National, we have a four-year panel (2009-2012) of schools. Pupils who completed 6 grades of primary education in a given year may take part in the test. For three of these four years (2010-2012) we have the test scores of individual pupils, allowing us to calculate averages and standard deviations per school. The data further contain name and municipality of the school, the age of each pupil at the time of the test, the gender of the participant and the result obtained on each of the 4 topics (French, Mathematics, Kirundi and Environmental Science). We merge these data sets with four other sources of data: first, the election results from the 2010 parliamentary elections;⁴ second, the distance of each municipality to the province of origin of president Pierre Nkurunziza (the municipality of Mwumba in the northern province of Ngozi); third, a data set on the public expenditure allocated to the schools by the Ministry of Education;

⁴ Five elections were held in the period June to September 2010, each for a different level of government. We use the results of the first of those five elections, to wit the parliamentary elections, as these elections were contested by all parties and thus give us a good measure of the relative strength of each party. The four subsequent elections were boycotted by all but two parties.

and fourth, a data set on the quality of education in 125 schools collected from 2006 to 2008 by PASEC (Programme d'Analyse des Systèmes Educatifs de la CONFEMEN). We will use the later to analyse pre-election trends.

Table 4: Description of Test Score and other Data

| | (i) school level panel | (ii) Election results per municipality | (iii) Public expenditures | (iv) school quality |
|---------------------------|---------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------|---------------------|
| N schools/ Municipalities | 2104 | 134 | 2104 | 125 |
| N observations | 8416 | 134 | 6312 | 375 |
| Years | 2009-2012 | 2010 | 2010-2012 | 2006-2008 |
| Key variable(s) | Success rate in Concours National (3 y) Mean and stan.dev. (4 y) | % votes for CNDD-FDD in parliamentary elections | Budget allocated each year to each school by Ministry of Education | Success rate |

Sources: (i) and (iii) Ministry of Education; (ii) National Electoral Commission; (iv) PASEC (Programme d'Analyse des Systèmes Educatifs de la CONFEMEN)

For the Concours National organized in 2009 we only have the percentage of pupils per school who succeeded that year, we do not have information on individual test scores or averages. Table 4 presents an overview of the data sources for the test scores. Table 1 showed average test scores and standard deviations for each of the three years for which we have individual data. The 2009 Concours National took place a year before the 2010 elections and the 2010 one took place several weeks after the 2010 elections. We can use the 2009 success rate as our baseline (the 2010 one for averages and standard deviations), which gives us school-level success rates from before as well as after the 2010 elections. The Ministry does not keep electronic files of previous years, so we do not have older data for the universe of schools. However, for a random selection of 125 schools we do have older data collected by the PASEC program.

Figure 5 (b-d) shows the evolution of success rates over time, with Figure (b) making the comparison between Mwumba municipality and all other municipalities, Figure (c) doing the same with all municipalities of the province of Ngozi and lastly Figure (d) comparing

northern with southern municipalities. Notice that, in comparative perspective, Mwumba makes the largest leap in 2010, Ngozi province does so in 2011 and the northern provinces taken together do so in 2012.

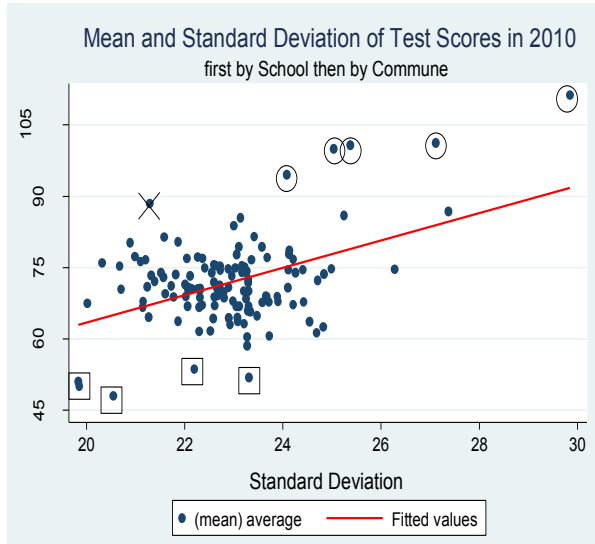
In Figure 5(a) Mwumba municipality is indicated with an 'x'. It is marked by a combination of a very high average and a very low standard deviation. The municipalities indicated with a 'O' are municipalities with a high average and a high standard deviation. They are all part of the capital, not surprisingly, and such a result is exactly what we would expect to see in a capital, which comprises very strongly- as well as very weakly-performing pupils/schools (see the discussion above on intra-capital variation). The municipalities indicated with an '□' have very low averages and low standard deviations. They are all very poor rural municipalities, again what we would expect to see. The double-strike outcome in Mwumba on the other hand is something we would only expect to see in a high-performing and egalitarian education system, such as in Scandinavian regions. The equivalent in the growth literature would be to achieve economic growth together with a reduction in inequality. Every economist knows how difficult to that is to achieve. Notably, Mwumba is the municipality of origin of president Nkurunziza.⁵

We thus suspect that the 2010 results for this municipality have been subjected to political interference, something we do not observe for any other municipality in that same year. In 2011, the year following the landslide victory, a similar increase occurred for the entire province of Ngozi, as can be seen in the results of the changes in the success rate, from 38% in 2010 to 51% in 2011. The province of Ngozi, which is comprised of eight other municipalities apart from Mwumba, is the president's home turf. Its provincial capital,

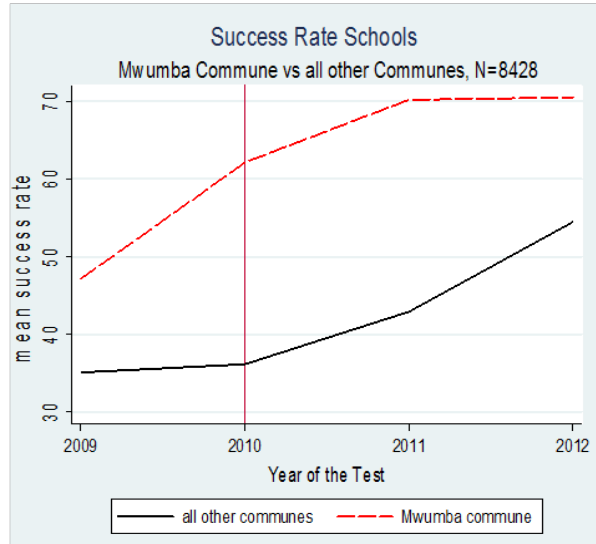
⁵ We take a closer look at the average and the standard deviation of the test scores when we discuss the mechanism at work.

Figure 5 (a): Mean and Standard Deviations of School Test Scores (all municipalities) in 2010 and (b-d) Success Rates in Mwumba, Ngozi and in all Northern Provinces '09-'12

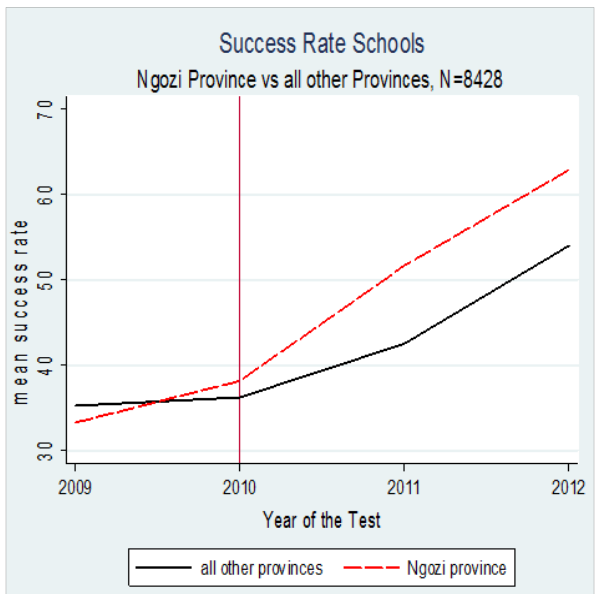
(a)



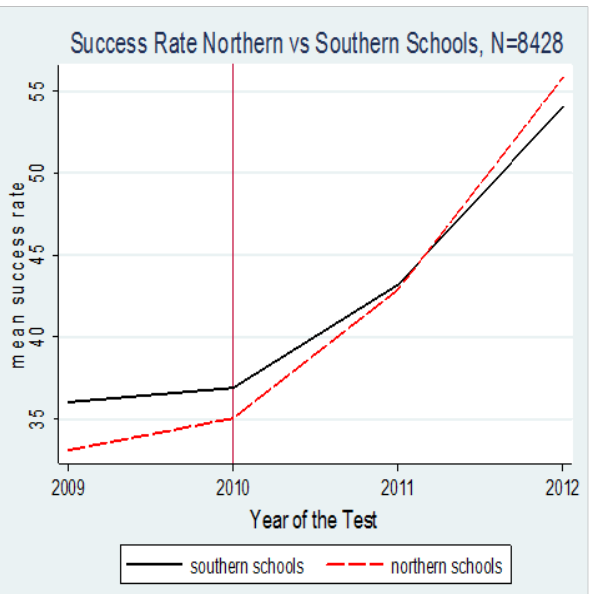
(b)



(c)



(d)



also called Ngozi, is his favourite place of residence. Many government meetings and ministerial councils are held there, rather than in the capital Bujumbura. The president had a new football stadium build in Ngozi, as well as a new university. The extension of the spoils of power to the whole province can also be regarded as a response to popular demand in a “quid pro quo” model of ethnic favoritism. His many supporters in the north regard him as ‘their’ president. In 2012, the data reveal that the entire northern region, which includes the province of Ngozi and its four neighboring provinces, benefited from that power. The success rates on the Concour National in the president’s favorite region witnessed a formidable increase after the landside: 15 percentage points in Mwumba in 2010, 13 percentage points in Ngozi province in 2011 and 13 percentage points in the group of northern provinces in 2012. Figure 6 depicts a map of Burundi with concentric circles around the municipality of Mwumba. Each subsequent year, starting with Mwumba itself in 2010, a new circle benefited from the extension of presidential influence into their circle. The darkest color is Mwumba municipality, followed by Ngozi province and all northern provinces.

These striking changes do not necessarily mean that the president himself interfered to manipulate the results. The pattern we observe is also compatible with loyal or zealous civil servants who want to please the president and make progress in their own career by presenting high success rates for his favored municipality and province in a domain (education) that the president cares about a lot.

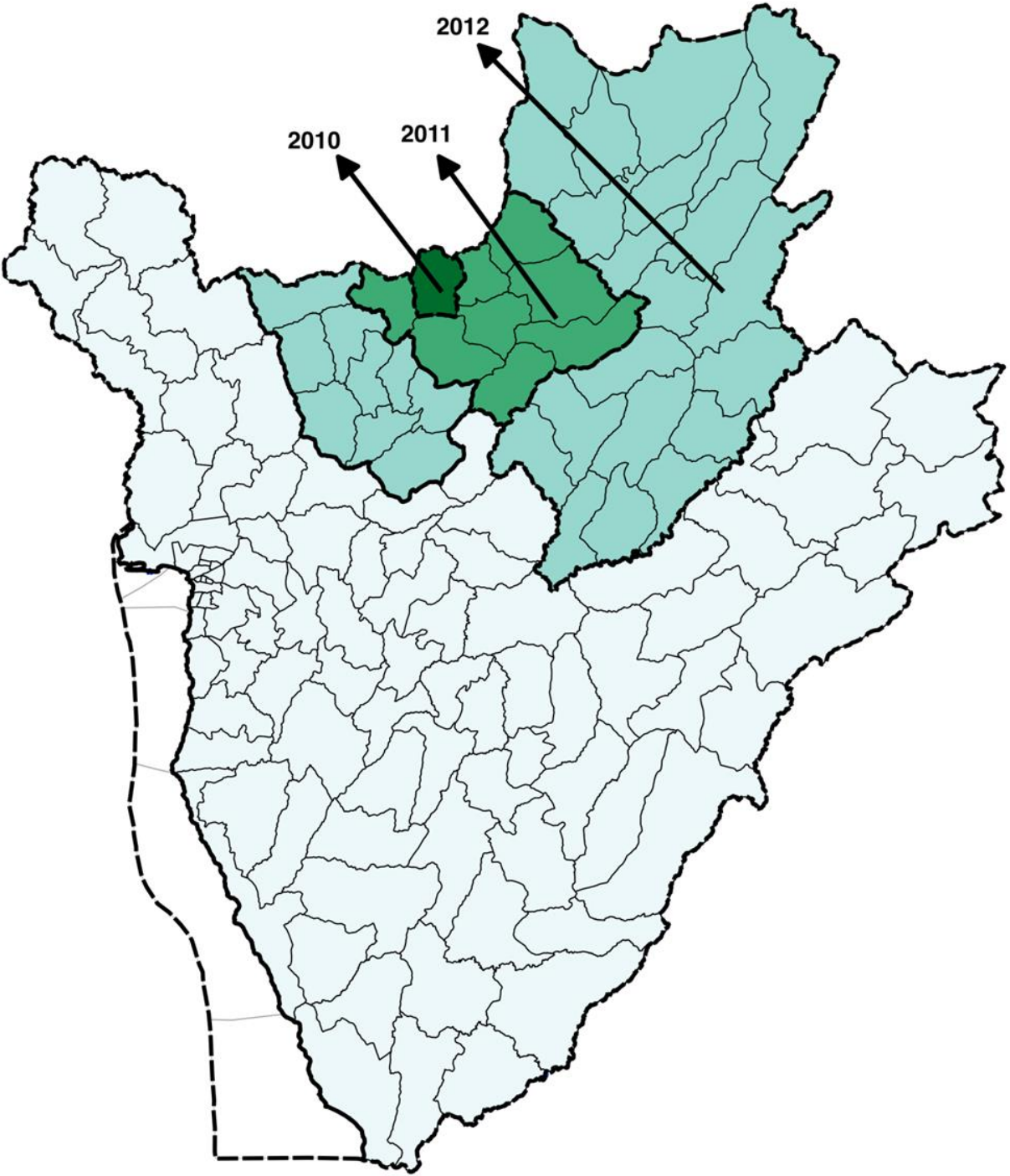


Table 5 presents difference-in-differences results which underlie Figure 6, resulting in outcomes that are akin to what we could observe already in Figure 5 (b-d). Starting with the municipality of Mwumba we notice a sharp increase (+15 percentage points) vis-à-vis other municipalities (+1 percent point) from 2009 to 2010, even though Mwumba already had a relatively high success rate in 2009. In 2011 Mwumba improved again, but, compared to 2010, the increase was now more in line with the increase in other municipalities. It is hard to improve even more when one is already the best scoring municipality in the country (see below). Performing the same analysis at the province level with Ngozi versus all other provinces, we notice the sharp improvement in 2011. And similarly, extending the analysis to the northern region to include all neighboring provinces of Ngozi, we notice a sharp improvement a year later, in 2012.

The values in **bold** in table 5 show the gradual improvement over time and over space: in 2010, Mwumba improved strongly (compared to 2009) and maintained its high success rate compared to the other municipalities in 2011 and 2012. Ngozi province (of which Mwumba is one of the 9 municipalities), improved strongly in 2011 (compared to 2009 and 2010) and maintained its high level in 2012. And lastly, all northern provinces (of which Ngozi is one) improved strongly in 2012 (compared to 2009, 2010, and 2011).

The values 2.55 and 1.40 in *italics* in the last column, both applying to 2011, become smaller (resp. 0.22 and -0.10) and statistically insignificant when we drop Ngozi from the group of northern provinces, exactly because this province has ‘benefitted’ already in 2011 and are thus ‘artificially’ high. In other words, without Ngozi, the northern group does not have a statistically significant difference compared to the other provinces in 2011. The same applies for the value of 4.10 (in the middle column) and 1.15 (in the last column) both applying to 2010: they decrease (resp. to 2.93 and to 0.32) when we remove Mwumba from the group of municipalities within Ngozi as Mwumba has ‘benefitted’ already in 2010.

When we perform the same operation respectively for the northern provinces (removing Ngozi province) in 2012 and for Ngozi province in 2011 (meaning removing Mwumba municipality), the statistical significance of the values in bold remains. Both these observations point again at the gradual extension of higher success rates beyond Mwumba

municipality, in 2011 in the rest of the province of Ngozi and in 2012 in the other northern provinces.

Table 5: Success Rates, Difference-in-Differences Analysis of Mwumba Municipality, the Province of Ngozi ^(a) and the Northern Provinces ^(b), respectively, versus the rest of the country, N=2105

| | Mwumba | Rest | Diff | Ngozi | Rest | Diff. | Northern province | Rest | Diff. |
|-------|--------|--------|-----------------|--------|--------|------------------|-------------------|--------|-----------------|
| | N=14 | N=2091 | | N=133 | N=1972 | | N=620 | N=1485 | |
| 2009 | 47.16 | 35.07 | +12.09*** | 33.30 | 35.27 | - 1.97* | 33.05 | 36.02 | -2.96*** |
| 2010 | 62.16 | 36.19 | +25.94*** | 38.34 | 36.23 | +2.10* | 35.09 | 36.90 | -1.80** |
| 2011 | 70.23 | 42.94 | +27.28*** | 51.56 | 42.55 | +9.01*** | 42.85 | 43.24 | -0.39 |
| 2012 | 70.51 | 54.48 | +16.03*** | 62.88 | 54.03 | +8.86*** | 55.83 | 54.07 | +1.77** |
| Diff. | | | Diff.in Diff | | | Diff.in Diff | | | Diff.in Diff |
| 10-09 | +15.0 | +1.2 | +13.8*** | +5.04 | +0.95 | +4.10*** | +2.04 | +0.88 | +1.15* |
| 11-09 | +23.07 | +7.87 | +15.2*** | +18.26 | +7.27 | +11.00*** | +9.80 | +7.22 | +2.57*** |
| 12-09 | +23.35 | +19.41 | +3.94 | +29.58 | +18.77 | +10.8*** | +12.78 | +18.05 | +4.73*** |
| 11-10 | +8.07 | +6.75 | +1.34 | +13.22 | +6.32 | +6.92*** | +7.76 | +6.34 | +1.40* |
| 12-10 | +8.35 | +18.29 | -9.91 | +24.54 | +17.8 | +6.76*** | +20.74 | +17.17 | +3.58*** |
| 12-11 | +0.28 | +11.54 | -11.25 | +11.32 | +11.48 | -0.15 | +12.98 | +10.83 | +2.16*** |

(a) consists of the municipality of Mwumba and 8 other municipalities, (b) consists of the province of Ngozi and its neighboring provinces Kayanza, Karusi, Muyinga and Kirundo.

As we perform panel data analysis further on in the paper, we want to point out that the above results rest on the assumption that before 2010, the northern and southern provinces share a common trend. Ideally we would have data from the universe of schools for several years before 2010, but we do not have that. Instead we are fortunate to have data from a study performed by PASEC among 125 randomly selected schools in 2010. This data source contains the success rates of these schools from 2006 to 2008. Hence, we use this sample to investigate whether or not the northern and southern schools share the same trend prior to 2010. We present the results in table 6 and Figure 7. In table 6 we first regress the difference in success rate between 2012 and 2010 in each school on the north-south dummy variable and then we do the same for the difference between the 2010 and the 2006 success rates. Of the 125 schools, 39 are in the north and 86 are in the south. Results presented in Table 6 point to the presence of a common trend before 2010. When we do the same analysis for the province of Ngozi versus the rest, we estimate a coefficient

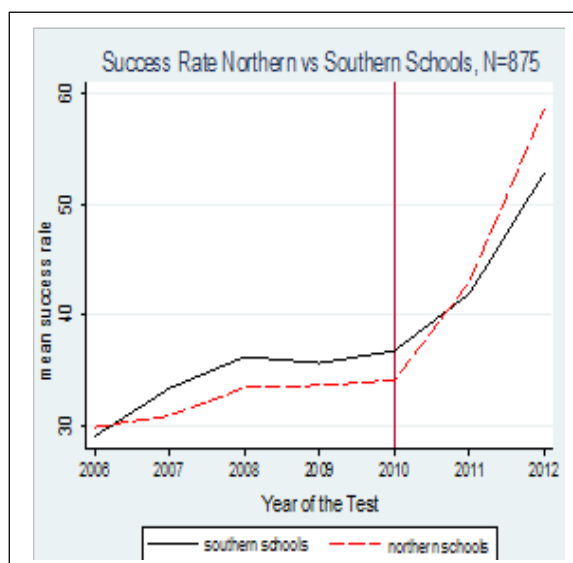
of -0.45 (7.1) [p=0.949] for 2010-2006 (which is -1.06 (7.4) [p=0.88] when 11 cases of missing values are replaced by their 2007 values). As only 11 of the 125 schools are from Ngozi province we interpret this result with some caution. For 2012-2010 the coefficient of the Ngozi province dummy is 6.86*** (1.49) [0.000]. Thus, it seems that northern (including Ngozi) and southern provinces share a common trend prior to 2010.

Table 6: verifying common trend assumption

| OLS | Difference in success rates | |
|---------------------------|-----------------------------|----------------------------|
| | 2010-2006 N=125 | 2012 -2010 N=2105 |
| North-south (north==1) | -2.8 (4.3) [p=0.519] | 3.60*** (0.8) [p=0.000] |
| Constant | 6.92***(2.4) [p=0.005] | 17.14*** (0.43) [0.000] |

Note: values -2.8 becomes -4.7 (4.5)[p=0.29] when we leave out 11 cases of missing values for 2006 that have been replaced by their 2007 values.
Source: PASEC, 2010 and Ministry of Education.

Figure 7: north versus south, 7 years



(b) Best performing Municipality in the Country

As mentioned, we have data on the success rate of the universe of primary schools for four consecutive years (2009-2012). From these data we derive that the schools in Canton B (one of the five educational regions of the capital) are the best or second-best performing nationwide in all four years. We are dealing here with the richest part of the capital and of the whole country, with the largest concentration of university educated parents, in what is otherwise a very poor country. The difference between Canton B and the next-best-performing region within the capital is large, each year about 20 to 30 percentage points. This indicates again the large inequality within the capital as mentioned above. See table 7.

In 2010, Mwumba commune in Ngozi province became the second best performing municipality of all of Burundi's municipalities, with a success rate of 62.1%, almost as high as the best performing commune in the capital (62.5%). This is unexpected as Mwumba is a rural municipality in the very north of the country with a headcount poverty rate of 68.9% in 2006 (somewhat above the average headcount in the country of 66.8%), compared to a headcount poverty of 0% in the best performing municipalities of the capital (Kinindo, Ngarara and Ruhoro). When we relate the poverty headcount to the success rate in the 2010 Concours National in a simple OLS framework, the fitted line tells us to expect a success rate of 34% instead of 62% for a headcount poverty of 68.9%. On top, the difference between Mwumba municipality and the runner-up municipality in Ngozi province is 19 percentage points, a larger difference than within the capital, where the best and the runner-up show a difference of 16 percentage points.

The outcome can also be studied in terms of averages: the pupils of the schools in Mwumba municipality scored on average 90/200, which was the 5th best result of the 130 municipalities and by far the best result of all rural municipalities. Moreover, the second-best-scoring municipality in Ngozi province scored only 74/200, a difference of 16 points. None of the other 16 provinces shows a similar difference between the best scoring and the second-best scoring municipality. In the other provinces we find differences between 1 and 4 points maximum, not 16 points. There is no sensible reason why Mwumba stands out so much from all other municipalities in the province of Ngozi nor from all other rural municipalities in the country.

For the entire province of Ngozi, of which Mwumba is a part, similarly sharp progress comes one year later. In 2011, not only the municipality of origin of the president, but his entire province of origin, Ngozi shows a strong performance in the Concours National. As in 2010, Mwumba commune is performing as good as the best performer in the capital, but the province of Ngozi now has 3 municipalities in the top-10 performing municipalities. In 2010 it only had 1 (Mwumba) in the top 10. Moreover, the difference with the runner-up is now only 6.5 percentage points whereas it is 29.2 for the capital. This pattern is confirmed for 2012 with Ngozi province is represented with 5 municipalities in the top 20, far exceeding all other 16 provinces.

The 2011 and 2012 data suggest we should be suspicious about results beyond Mwubma municipality. As described above, in 2011, three municipalities of the province of Ngozi turn up in the top 10 of best scoring municipalities, four in the top 16 and 5 in the top 28. To compare, in 2010 only 1 municipality (the president's municipality of birth) turned up in the top 35. No other province demonstrates such drastic improvement in one year. As the 2011 exam was more difficult than the 2010 one (with respective averages of 71 and 64), the fact that among the only 5 municipalities that managed to improve their score, 3 are from the province of Ngozi (the remaining two are from all other 16 provinces combined), is telling. Last but not least, in the list of top-10 schools within Ngozi province, 7 schools are from Mwumba commune.

We also looked at the success rates of the schools in the municipalities of origin of all Ministers of Education serving in the government of President Nkurunziza (see section 3a). We did not find a pattern in the success rates in these communes during their tenure as minister nor a significant change when they became minister or when they lost their position. However, from 2005 to 2009 the Minister in charge of Primary Education came from the south (Bururi) and his successors came from the north (Kirundo and Cankuzo), a switch coinciding with the observed changes in test scores in the northern provinces, in particular in 2012.

Table 7: Best performing municipalities in terms of success rates

| Year | Name of the municipality | Name of the Province* | Success rate | Success rate of runner-up | Freq. of prov. in nationwide top 10-20 |
|------|--------------------------|-----------------------|--------------|---------------------------|----------------------------------------|
| 2009 | Canton B | Bujumbura Capital | 60.0 | 40.65 | 1 - 2 |
| | Bugarama | Bujumbura Rural | 53.0 | 52.2 | 2 - 2 |
| | - | All other | 43.3 | 39.7 | 1.5 - 2 |
| 2010 | Canton B | Bujumbura Capital | 62.5 | 46.5 | 2 - 2 |
| | Mwumba | Ngozi | 62.1 | 43 | 1 - 2 |
| | - | All other | 42.6 | 40.1 | 1.75 - 1.75 |
| 2011 | Canton B | Bujumbura Capital | 71.8 | 42.6 | 1 |
| | Mwumba | Ngozi | 71.4 | 64.9 | 3 - 4 |
| | - | All other | 53.3 | 47.8 | 1 - 1.7 |
| 2012 | Tangara | Ngozi | 82.6 | 69.7 | 3 - 5 |
| | Canton B | Bujumbura Capital | 82.3 | 54.6 | 1 - 1 |
| | - | All other | 61.7 | 57.8 | 2 - 2.3 |

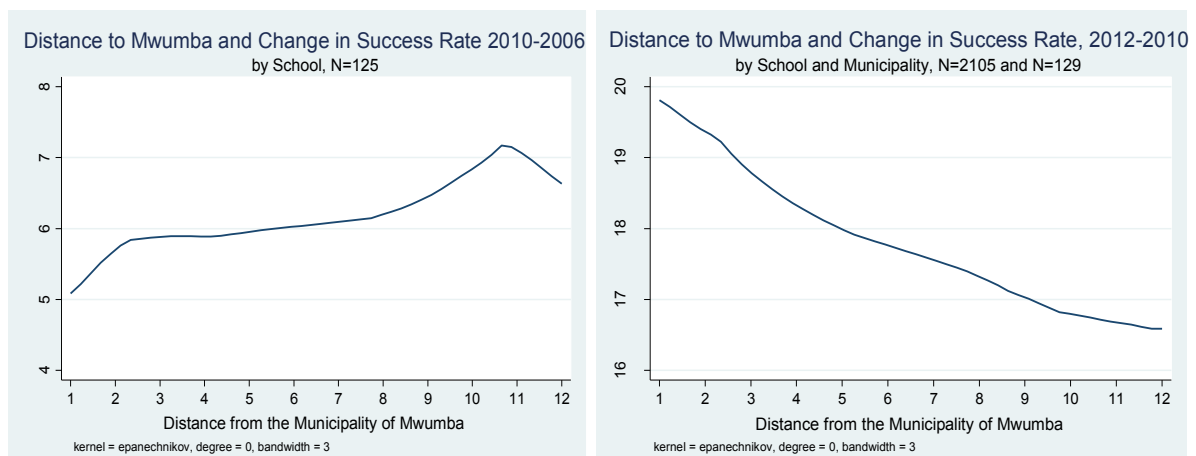
*'all other' signifies the average % of success in the best scoring municipality of each province, excluding the provinces with the two top performing municipalities

5. Identification strategy and Empirical Specification

(a) Step 1: distance

Our identification strategy consists of two steps. In the first step we build on Figure 6 and previously shown Difference-in-Differences results. This can be illustrated by examining the nonparametric relationship between on the one hand, the changes in the success rate, and on the other hand, the distance between any given municipality and Mwumba, the municipality of origin of president Nkurunziza. In Figure 8 we estimate a kernel-weighted local polynomial regression of difference in success rates on distance using an Epanechnikov kernel. “Distance” is expressed here as the number of municipalities that lie between Mwumba and another municipality. The point is that before 2010 there was no relationship between this distance and changes in the success rate, as can be inferred already from table 6 and figure 7 using the PASEC data for the common trend analysis. Figures 8 (a-b) shows this again with the distance. For the difference between the 2010 and the 2006 success rates we do not observe a particular relationship with the distance, which we do observe for the difference between the 2012 and the 2010 success rates: schools in municipalities close to Mwumba see their success rate increased more than schools further away.

Figure 8(a-b): Distance to to the Municipality of Mwumba and Change in Success Rate, before 2010 and after 2010



Since this distance remained the constant, something else must have changed that is captured by the distance variable. This ‘something else’ here is the political salience of the home turf of president Nkurunziza after his party won the 2010 elections. Hence, the identification in this step comes from interacting the distance with the year in which the test took place.

In the regression analysis, an important question is whether to include a lagged dependent variable, and if so, how to best do so. Lagged dependent variables can account for measurement error (often present in income or expenditure data), noise, and potential catch-up effects. According to Angrist and Pischke (2008), the lagged dependent model should be preferred when the assumption “that the most important omitted variables are time-invariant doesn’t seem plausible”. We need to judge if that is the case for the data used in this paper. In addition, McKenzie (2012) argues that in cases of low autocorrelation of dependent variables, controlling for the lagged dependent variable is more powerful than either employing the difference-in-difference estimator or the single difference estimator. His intuition is that, in cases where baseline data have little predictive power for future outcomes, it is inefficient to fully correct for baseline imbalances.

In our data, we do not have low correlation between 2009 and 2012 success rates (the Pearson correlation coefficient is 0.48***). Moreover, as we work with administrative data we have less measurement error compared to many other types of sources. What remains from the above arguments is the question on the importance of omitted time-variant regressors. If we have reason to believe that they are important, then we ought to prefer the lagged dependent model. Hence, considering all these possible arguments, there seem to be few reasons left to include a lagged dependent variable. However, since the effect of inclusion remains an empirical question, we will first estimate the FE model and then include a lagged dependent variable to control for potential dynamic effects and omitted time-variant regressors. In addition, we will also include a limited number of time-variant regressors that may have an effect on the success rate to ease concerns that their omission may bias results.

Building on these arguments and on Figure 8 we thus estimate success rates for a panel of schools for which we have four data points (2009-2012) using the following dynamic specification

$$S_{ijt} = \alpha_0 + \gamma_t + \beta_1 S_{ij(t-1)} + \beta_2 D_{ij} + \beta_3 (D_{ij} * \gamma_t) + C_{ijt} + u_{ij} + \varepsilon_{ij} \quad (1)$$

Here S is the success rate obtained by school i from municipality j at time t (from 2009 to 2012). γ is the year fixed effect to account for the particularities of each test year; D is the distance of each (school within each) municipality to the municipality of origin of President Nkurunziza. $D*\gamma$ captures the interaction effect between the year of the test and the distance, with β_3 our variable of interest; C are time-varying control variables at the level of the school, u is the school fixed effect and ε is an idiosyncratic error term.

We use several econometric specifications, each of which addresses a feature of a dynamic process with large N (2105 schools) and small T (4 years). We first estimate a pooled OLS regression as a benchmark. We then continue with a Fixed Effects model which removes unobserved heterogeneity at the school level and allows to estimate the effect of time-varying regressors (the interaction terms between the year of the test and the distance as well as time-varying controls) while the school effect u_i is differenced out (together with all school specific characteristics) and no assumptions need to be made on u_i . FE models do not allow to investigate research questions involving time-invariant school-level characteristics.

The third specification involves General Methods of Moments (GMM) which is the preferred workhorse for dynamic panel data estimation. We will use it in its ‘system’ as well as its ‘difference’ form. We use GMM as the scholarly literature has criticized the inclusion of lagged dependent variables in FE models. Nickell (1981) reports that the demeaning process in FE models creates a correlation between the regressor (in this case the lagged dependent variable) and the error term, which creates a bias in the estimate of the lagged dependent variable. The first difference transformation (which removes the school FE and the constant) opens the door to a solution as we can construct instruments for the lagged dependent variable from its second and third lags (Anderson-Hsiao estimator). These lags will be highly correlated with the lagged dependent variable (and its difference) but uncorrelated with the composite error process.

Arellano and Bond (1991) however show that the Anderson-Hsiao estimator fails to take all of the potential orthogonality conditions into account. The Arellano–Bond estimator sets up a generalized method of moments (GMM) problem in which the model is specified as a system of equations, one per time period, where the instruments applicable to each equation differ (for instance, in later time periods, additional lagged values of the instruments are available). The instruments include suitable lags of the levels of the endogenous variables (which enter the equation in differenced form) as well as the strictly exogenous regressors and any others that may be specified. A potential weakness in the Arellano–Bond estimator was revealed in later work by Arellano and Bover (1995) and Blundell and Bond (1998). The lagged levels are often rather poor instruments for first differenced variables, especially if the variables are close to a random walk. Their modification of the estimator includes lagged levels as well as lagged differences. The original estimator is often entitled difference GMM, while the expanded estimator is commonly termed System GMM. The cost of the System GMM estimator involves a set of additional restrictions on the initial conditions of the process generating the dependent variable.

(b) step 2: election results

As the distance to the municipality of origin of the president can capture many things, we go one step further to come closer to a political economy interpretation of the findings. This second step in our empirical identification strategy can be illustrated by examining the nonparametric relationship between the changes in the success rate on the one hand, and the results of the 2010 parliamentary elections on the other. In Figure 9 we estimate a kernel-weighted local polynomial regression of difference in success rates on electoral results using an Epanechnikov kernel. Success rates in 2012 compared to 2010 increase in municipalities with a higher % of votes for the CNDD-FDD. Notably, before 2010 there was no relationship between this election outcome and changes in the success rate. We show this in Figure 9(a) and in table 8 using the PASEC data. Schools in municipalities with strong support for CNDD-FDD see their success rates increase after 2010, but not before 2010, and school in municipalities with low electoral support do not experience increases in success rates. The identification in this second step then comes from interacting the 2010 electoral results with the year in which the test took place.

Building on Figure 9, we estimate success rates for a panel of schools for which we have four data points (2009-2012) using the following dynamic specification:

$$S_{ijt} = \alpha_0 + \gamma_t + \beta_1 S_{ij(t-1)} + \beta_2 E_j + \beta_3 (E_j * \gamma_t) + C_{ijt} + u_{ij} + \varepsilon_{ij} \quad (2)$$

Whereby E is the % of votes for CNDD-FDD in the 2010 parliamentary elections and all other variables are as in equation (1). The observations made above on FE, FD and Arellano-Bond estimators equally apply to the estimation of equation (2).

Figure 9(a-b): Election Results and Change in the Success Rate, before and after 2010

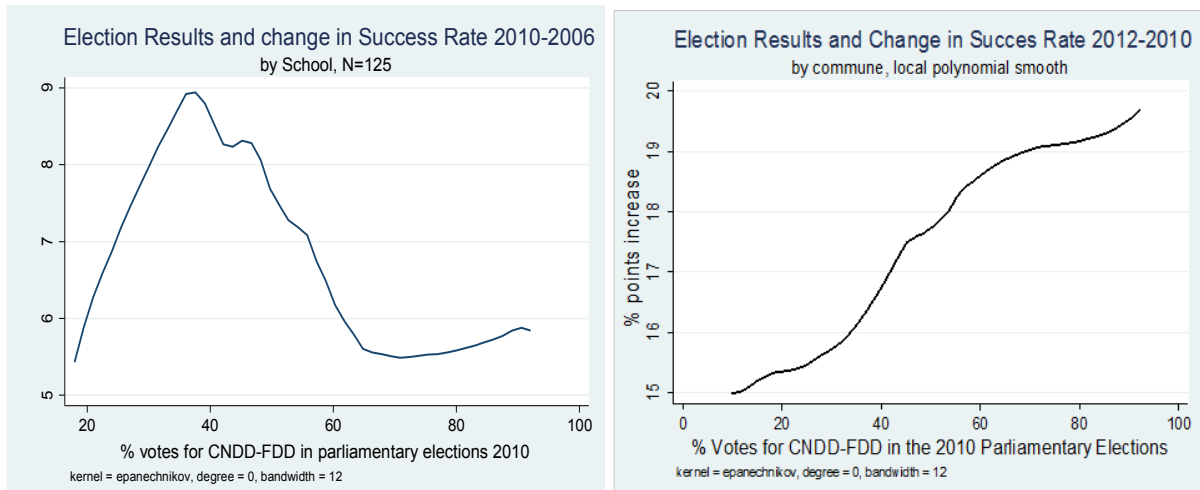


Table 8: Election Results and Change in the Success Rate

| OLS | Change in the Success Rate | |
|--------------------------------------------|----------------------------|----------------------|
| | 2010-2006, N=125 | 2012-2010, N=2105 |
| <i>Electoral result</i> (x<60% is base) | | |
| 80%>x>60% | -2.20 (5.04) | -0.12 (0.83) |
| x>80% | -3.00 (5.21) | 2.16** (0.99) |
| Constant | 7.91** (3.87) | 17.79*** (0.63) |

Figure 10: % Schools with highest change, by election result

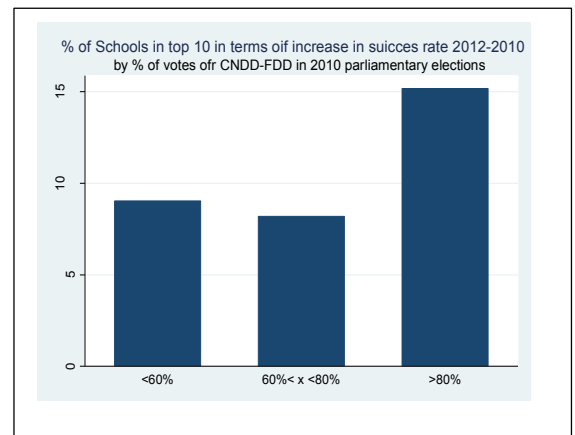
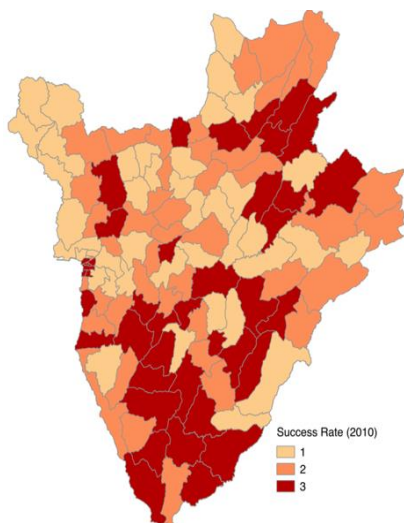


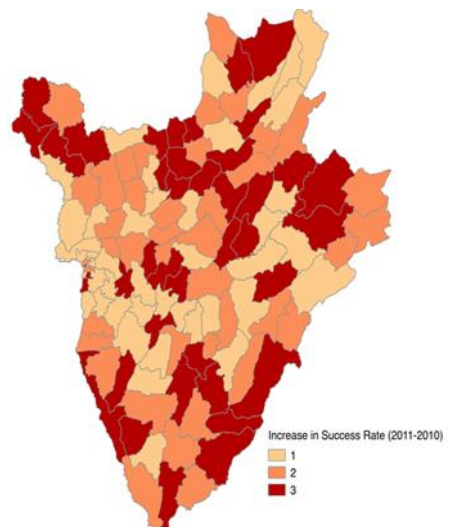
Figure 11, Panel (a), presents the success rate for each municipality in the 2010 Concours National (darker is higher) overlaid on the map of Burundi; Panels (b) and (c) give the changes in respectively 2011 and 2012 vis-à-vis 2010 (darker is larger change); and Panel (d) maps the electoral outcomes (darker is higher % of votes for CNDD-FDD).

Figure 11: (Changes in) test scores 2010-2012 and 2010 Election Results

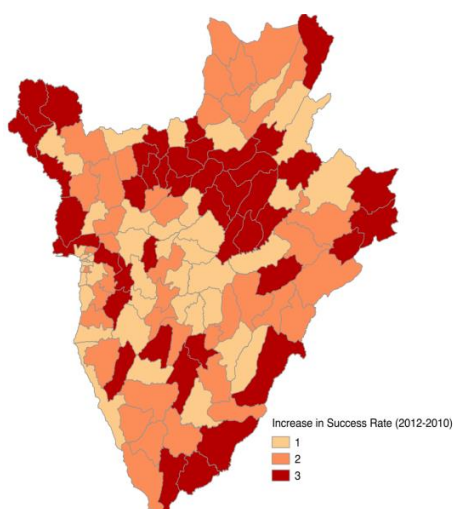
(a) 2010 success rate



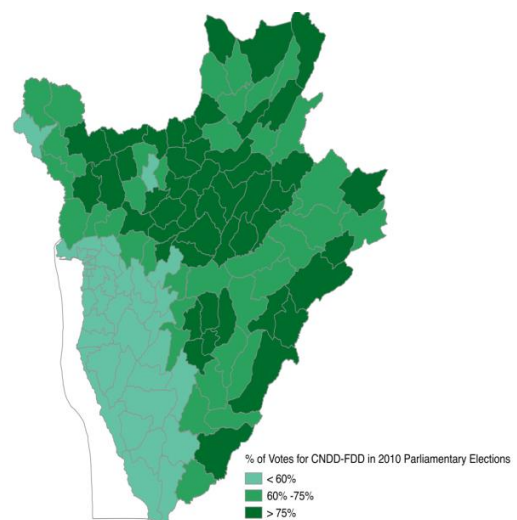
(b) Changes in success rate 2011-10



(c) Changes in success rate 2012-10



(d) Election Results
(% vote for CNDD-FDD, 2010)



6. Regression Results on Success Rates

Estimating equations (1) and (2), first we present results on the success rate using the proximity to the president's municipality of birth (table 7(a) and (b)) and then with the election results. We present OLS, panel FE, first difference, and GMM estimations to demonstrate the robustness of the results, as each estimation comes with its own advantages and limitations. We have 4 years of data for our dependent variable (success rates) but only 3 years for our time-varying controls (cohort size and amount of subsidies). As a result, we present results with and without the controls.

In Columns 1 and 2 in table 7(a1) we present OLS and panel FE models as a benchmark. We find that the interaction between the year of the test in 2011 and 2012 and the areas close to the municipality of birth of the president are statistically significantly different from zero at the 1% level. Columns 3 and 4 use the same models but include the time-varying control variables cohort size and amount of subsidies, both measured at the school level. We remark that coefficients for the interaction variables in column 4 turn negative now (while remaining statistically significantly different from zero) because the year 2012 functions as the base here. Given the presence of panel data, and referring to the discussion in in section 5a, we need to consider estimates that take the dynamic element into account, which we do in table 7(a2). Results on the interaction variables are confirmed, in particular the years 2011 and 2012 with Ngozi province. Since one could argue that the amount of subsidies could be endogenous to the political interference that seems to be at issue, we present results where subsidies are treated as exogenous (Column 2) as well as endogenous (Column 4). However, among the controls considered, the amount of subsidies does not seem to affect the success rate (apart from the pooled OLS model). On the other hand, the size of the cohort (the number of pupils in a given year in a given school) does: the larger the cohort, the lower the success rate.

Table 7(a)1: Success Rate and Proximity to President's Municipality of Birth:
Pooled OLS and Panel FE models

| Model | no controls (N=8428) | | with time-varying controls(N=5300) | |
|--------------------------------------------------------------|-------------------------|--------------------------|------------------------------------|---------------------------|
| dep. var. indep.var | Pooled OLS | Panel FE | Pooled OLS | Panel FE |
| <i>Year of the test</i> | 2009 is base | | 2012 is base | |
| 2010 | 0.88 (0.64) | 0.88*** (0.38) | -16.04*** (0.79) | -17.60***(0.57) |
| 2011 | 7.19*** (0.66) | 7.19*** (0.42) | -10.44*** (0.72) | -11.11***(0.45) |
| 2012 | 18.02***(0.66) | 18.02***(0.45) | - | - |
| <i>Prox. to Mwumba (all southern provinces=base)</i> | | | | |
| All northern prov. except Ngozi (n_p) | -3.00***(0.80) | - | -0.52 (0.93) | - |
| Ngozi prov. (N_g) except Mwumba | -4.33***(1.29) | - | 5.26 *** (1.9) | - |
| Mwumba Commune (M_w) | 11.14*** (3.33) | - | 20.70*** (4.21) | - |
| <i>Interact. var.</i> | | | | |
| y2010*n_p | 0.26 (1.16) | 0.26 (0.76) | -1.7 (1.27) | -2.05** (0.93) |
| y2010*N_g | 2.82 (1.84) | 2.82 ** (1.33) | -6.43*** (2.47) | -7.92***(1.96) |
| y2010*M_w | 14.10*** (5.17) | 14.10***(3.72) | - | 7.51 (5.84) |
| y2011*n_p | 0.25 (1.21) | 0.25 (0.84) | -1.7 (1.30) | -1.60** (0.80) |
| y2011*N_g | 10.63***(2.09) | 10.63***(1.79) | - | -1.43 (1.66) |
| y2011*M_m | 15.87*** (4.37) | 15.87***(3.16) | 2.65 (5.20) | 9.7 * (5.99) |
| y2012*n_p | 2.84** (1.21) | 2.84*** (0.91) | - | - |
| y2012*N_g | 12.29***(2.04) | 12.29***(1.82) | 1.9 (2.65) | - |
| y2012*M_w | 5.33 (5.59) | 5.33 (5.24) | -6.87 (6.36) | - |
| <i>Control var.</i> | | | | |
| Cohort size | | | -0.09***(0.007) | -0.11 *** (0.01) |
| Subsidies | | | 0.10*** (0.40) | -0.01 (0.03) |
| Constant | 36.02***(0.45) | 35.15*** (0.22) | 59.67*** (0.85) | 63.27 *** (1.22) |
| N groups | | 2107 | | 1910 |
| Test statistic | F(15,8412)= 129.6*** | F(12,2106)= 272.33*** | F(13,5286)= 115.63*** | F(10,1909)= 244.91**** |

Table 7(a)2: Success Rate and Proximity to President's Municipality of Birth:
First Difference and System GMM models

| Model | with lagged dependent variable and time-varying controls | | | |
|--------------------------------------------------------------|----------------------------------------------------------|------------------------------------|--------------------------------------|-------------------------------------|
| dep. var. indep.var | First Difference | System GMM (difference eq.) | | |
| | (N=5300) | Subsidies exogenous (N=5300) | Cohort size exogenous (N=6300) | Subsidies endogenous (N=5300) |
| <i>Lagged dep.v.</i> | -0.21*** (0.02) | -0.11 (0.09) | -0.18** (0.08) | -0.13** (0.06) |
| <i>Year of the test</i> | | | | |
| 2010 | -19.17*** (0.60) | -43.79** (19.79) | -8.27*** (0.77) | -19.11***(1.21) |
| 2011 | -12.40*** (0.44) | -23.57*** (9.18) | - | -11.76*** (0.76) |
| 2012 | - | - | 10.39*** (0.61) | - |
| <i>Prox. to Mwumba (all southern provinces=base)</i> | | | | |
| All northern prov. except Ngozi (np) | - | -1.26 (1.45) | -1.12 (1.45) | -1.91* (1.05) |
| Ngozi prov. (ng) except Mwumba | - | -1.61 (1.77) | 4.41 (3.11) | -1.09 (1.95) |
| Mwumba Commune (mw) | - | 24.14*** (4.46) | -1.59 (8.49) | 17.21*** (5.68) |
| <i>Interact. var.</i> | | | | |
| y2010*n_p | -2.00** (0.97) | -2.64 (1.80) | - | 0.16 (0.96) |
| y2010*N_g | -9.61*** (2.17) | - | -5.95** (2.35) | - |
| y2010*M_w | 4.56 (5.90) | -0.30 (4.62) | - | -3.40 (4.12) |
| y2011*n_p | -1.56** (0.75) | - | -1.90* (1.15) | - |
| y2011*N_g | -2.75* (1.57) | 9.87*** (3.40) | -0.61 (1.81) | 6.59*** (1.82) |
| y2011*M_w | 9.04 (5.69) | - | 1.80 (4.24) | - |
| y2012*n_p | - | 6.80* (3.73) | -1.50 (1.62) | 1.31 (0.98) |
| y2012*N_g | - | 14.73*** (5.35) | - | 8.86*** (2.04) |
| y2012*M_w | - | -15.55** (7.48) | -0.24 (6.08) | -7.81 (6.21) |
| <i>Control var.</i> | | | | |
| Cohort size | -0.12*** (0.01) | | -0.70*** (0.18) | -0.30** (0.13) |
| Subsidies | -0.01 (0.03) | -2.47 (1.86) | | -0.10 (0.11) |
| Constant | 73.24*** (1.59) | 96.38*** (31.14) | 105.93*** (17.6) | 84.16*** (11.32) |
| N groups | 1910 | 1910 | 2100 | 1910 |
| Test statistic | | Wald chi2(13)= 992.36*** | Wald chi2(13)= 1583.69*** | Wald chi2(14)= 2398.65*** |

| | | | | |
|-----------------------------------------------|--|-------------------|-------------------|-------------------|
| Ar.-B. test for AR(1) in 1 st dif. | | $z = -2.91^{***}$ | $z = -3.87^{***}$ | $z = -6.34^{***}$ |
| N of instrum. | | 15 | 15 | 18 |
| Hansen-J test for overident. | | Chi2(1)=1.90 | Chi 2(1) =0.57 | Chi 2(3) =5.76 |

Continuing in table 8 with the findings using the *election results*, we find that test scores increased in 2011 and in 2012 in a statistically significant manner in schools in municipalities with a higher % of votes for CNDD-FDD in the 2010 parliamentary elections, no matter which of the models we are using for our estimation. The effect of the control variables is also consistent with previous specifications: the amount of subsidies received by the school does not seem to affect the success rate, whereas the size of the cohort does. The larger the latter, the lower the success rate.

Table 8(a): Success Rate and Electoral Results

| Model | Panel FE | First diff | System GMM with diff. eq. | Difference GMM |
|------------------------------------------|-----------------------------|------------------------------|--------------------------------|---------------------------------|
| dep. var. indep.var | no controls | lagged dep. and two controls | lagged dep. and subsidies exo. | lagged dep. and subsidies endo. |
| <i>Lagged dep.v.</i> | | -0.20 ^{***} (0.02) | -0.12 (0.10) | -0.16 ^{**} (0.07) |
| <i>Y.of the test</i> (2009 is base) | | | | |
| 2010 | 0.99 [*] (0.56) | -19.68 ^{***} (0.82) | -46.61 ^{**} (19.01) | - |
| 2011 | 6.41 ^{***} (0.62) | -14.09 ^{***} (0.63) | -25.46 ^{***} (8.30) | 6.09 ^{***} (1.01) |
| 2012 | 18.85 ^{***} (0.64) | - | - | 19.07 ^{***} (1.50) |
| <i>Election result</i> (<60% is base) | | | | |
| Medium (60-80%) | - | - | -3.08 ^{**} (1.49) | - |
| High (+80%) | - | - | 1.11 (2.08) | - |
| <i>Interact. var.</i> | | | | |
| y2010*med | 0.21 (0.81) | 0.73 (1.05) | -2.10 (1.42) | -0.55 (1.32) |
| y2010*high | 0.34 (0.76) | -1.28 (1.03) | -6.35 ^{**} (2.71) | 0.32 (1.41) |
| y2011*med | 1.23 (0.88) | 2.47 ^{***} (0.85) | - | 1.87 (1.18) |
| y2011*high | 3.22 ^{***} (0.87) | 1.52 [*] (0.81) | - | 2.94 ^{**} (1.19) |
| y2012*med | -0.84 (0.95) | - | 3.26 (4.03) | - |
| y2012*high | 2.38 ^{**} (0.93) | - | 3.60 (3.65) | - |

| | | | | |
|--------------------------------------------------|-------------------------|-------------------------|-------------------------------|------------------------------|
| <i>Control var.</i> | | | | |
| Cohort Size | | -0.12*** (0.02) | | -0.53*** (0.14) |
| Subsidies | | 0.001 (0.03) | -2.95 (1.98) | -0.07 (0.13) |
| Constant | 35.21*** (0.22) | 72.88*** (1.60) | 104.52*** (31.4) | - |
| N observations | 8387 | 5298 | 5298 | 3322 |
| N groups | 2097 | 1909 | 1909 | 1787 |
| Test statistic | F(9,2096)= 343.89*** | F(9,1908)= 267.60*** | Wald chi2(10) =711.67*** | Wald chi2(14) =1574.08*** |
| Ar.-B. test for AR(1) in 1 st dif. | | | z=-2.61*** | z=-4.17*** |
| N of instrum. | | | 12 | 12 |
| Hansen-J test for overident. | | | Chi2(1)= 2.48 p-value=0.11 | Chi 2(-2) =3.72 p-value=- |

7. A Political Economy of Ethno-Regional Favoritism

In order to understand the relationship between electoral outcomes and school test scores we have to consider both in a political economy framework. This framework, already mentioned in the introduction, considers the desire of the incumbent to stay in office as well as the desire of the voter to progress in life. There is a lot of evidence around that both play an important role in Burundi since the end of the civil war. On the one hand, President Pierre Nkurunziza has done everything he can to secure re-election: he spends a lot of time in the rural areas, is considered ‘close’ to the rural population, has abolished school fees for primary school and health fees for pregnant mothers and children under 5, is very active as a religious pastor, and believes that God handed him the presidency. On the other hand, there is a rural population, of which a large group, in particular the northern Hutu, have not benefited from education in the past. With land becoming ever more scarce and with a diploma needed to obtain a government job, the rural, northern population desperately wants to get educated. With a government firmly in the hands of CNDD-FDD, this is thus a very favorable setting for a “quid pro quo” approach to ethnic favoritism.

The number of seats in secondary school are limited and far below demand. In comparison with the schools in the southern provinces and in the capital Bujumbura, schools in the

northern provinces have underperformed. This is not a surprise and it is not new: southern schools have been outperforming northern schools for the past few decades. In the period under investigation a large school construction program was underway in Burundi, in particular in the northern provinces. The program started in 2010 and will increase the number of pupils attending school in the period under investigation. It is very unlikely to affect the results as pupils have to attend at least 6 years of education before they can take part in the Concours National.

From the start of his reign Pierre Nkurunziza, himself a teacher, set his eye on the countries' education system. He realized that education allowed the southern population in general and the Tutsi in particular to produce knowledge, prestige, and power. He wanted the northern population, in essence the northern Hutu, to have access to these sources of power. Indeed, as mentioned in the literature review, researchers often assume that regional favoritism coincides with ethnic favoritism. For northern Burundi this is indeed the case as very few Tutsi live there. Almost all Tutsi live in the south or in the capital (which does not mean they constitute the majority there). Hutu from the south are in general less supportive of the CNDD-FDD; they back other Hutu parties founded by Hutu leaders from their own region, such as Leonard Nyangoma. Hence, the favoritism demonstrated by President Nkurunziza applies first and foremost to the Hutu from the north, meaning a combination of ethnic and regional identity. Yet in his first term, with a Minister of Education from the south (Saïdi Kibeya), even though he was Hutu, we do not see an increase in success rates in northern schools.

One cannot catch up with decades of lead in education in just a few years' time. Because of better schools, more experienced teachers, better equipment and more experience with learning within families in the capital and in the south, pupils from northern provinces were on track to continue to lose in competition with pupils from the south, eg. in the Concours National. Nkurunziza was determined to change that, but must have realized that a standard way to achieve it, by investing heavily in education in the north, would take many years to bear fruit. Most likely his presidency would be over by then.

We thus infer that the regime, through the various levels of the administration, interfered in the results of the Concours National. There are several ways to achieve that, all of which

lead to a similar outcome. One way is to leak the questions of the Concours National beforehand to the schools in the north. This would allow the pupils to prepare themselves and result in better grades. The drawback of this method is that many people would be informed about such leak and it may become public knowledge. In fact, since 2010 rumors circulated in Bujumbura about the manipulation of test score results in nationwide exams. There is however another way to ‘help’ pupils from the north do better in the test. The regime only needs to ‘instruct’ those teachers who correct the tests. It used to be the case that the tests were not corrected by the same teachers who taught the pupils who took the test in his class, the tests were instead sent to other schools or other municipalities to be corrected by teachers who did not know the pupil. This guaranteed a certain degree of objectivity. This system however was abolished and replaced by a more centralized system whereby the Ministry decides who will correct the tests. Recall that, in the period under investigation here (2010-2012) the two Ministers in charge of Primary Education came from the north, which was not the case in the first mandate (2005-2010). It would be enough that the regime convinced or appointed a group of teachers/correctors who will correct the tests of the northern schools with a ‘benevolent’ mind to get the job done.

It is not difficult to find teachers/correctors in Burundi who would be willing to either spread the questions of the test beforehand or manipulate the correction afterwards, for several reasons: (i) many teachers from the north would be more than happy to ‘help’ their pupils get a ‘boost’ in the competition with the students from the south in general and Tutsi in particular (these teachers have themselves felt discriminated against when Tutsi were in power); (ii) The salary of teachers is very low, even compared with other occupations in the public administration; (iii) Corruption is endemic in Burundi and there is evidence that teachers and school directors are even more corrupt than other professions (Falisse and Leszczynska, 2017).

Hence, by giving the schools from the north a ‘boost’ in the Concours National the president kills several birds with one stone: he boosts his own popularity (and his chance for re-election) in a domain that he and the northern population cares about a lot, and he stops the domination of the schools from the capital and from the south in the production of graduates and thus the reproduction of knowledge, prestige and power.

8.The Mechanism at work

In the previous sections we focused on the success rate in the Concours National. In this section we want to obtain more insight on the mechanism at work, by looking at the average score in the exam as well the standard deviation. An improvement in test scores that touches the entire pupil population of a municipality or province – in contrast to the happy few within a class or a school - would be characterized by increased averages and decreased standard deviations. That is what we find, and the finding is compatible with the quest for mass political support through ethnic favoritism.

The results in table 9(a) and 9(b) suggest that the test score results in 2011 and 2012 improved, in a statistically significant manner, in municipalities where CNDD-FDD obtained a higher percentage of votes in the 2010 parliamentary elections. Improvement here refers to increased averages as well a reduced standard deviations. In Figure 12 we estimate a kernel-weighted local polynomial regression of difference in test score averages and standard deviations on electoral results using an Epanechnikov kernel. The horizontal axis shows the percentage of votes for CNDD-FDD in the 2010 parliamentary elections and the vertical axis shows the change in test scores, for 2011 (compared to

Table 9(a): Test score averages, Difference-in-Differences Analysis of Mwumba Municipality, the Province of Ngozi ^(a) and the Northern Provinces ^(b) respectively, versus the rest of the country, N=2100

| N=2100 | Average score | | | | | | | | |
|--------|---------------|--------|------------|--------|--------|------------|-------------|--------|------------|
| | Mwumba | Rest | Diff. | Ngozi | Rest | Diff. | North. Prov | Rest | Diff |
| | N=13 | N=2087 | | N=132 | N=1968 | | N=618 | N=1482 | |
| 2010 | 88.10 | 72.04 | 16.05*** | 73.31 | 72.06 | +1.24 | 70.92 | 72.64 | -1.72*** |
| 2011 | 78.33 | 64.70 | 13.63*** | 69.63 | 64.46 | +5.16*** | 64.71 | 64.81 | -0.10 |
| 2012 | 135.7 | 127.7 | 8.0*** | 132.36 | 127.39 | +4.97*** | 128.41 | 127.41 | +1.00** |
| Diff. | | | Dif in Dif | | | Dif in Dif | | | Dif in Dif |
| 11-10 | -9.77 | -7.34 | -2.42 | -3.68 | -7.6 | +3.92*** | -6.21 | -7,83 | +1.63*** |
| 12-10 | +47.6 | +55.66 | -8.05*** | +59.05 | +55.33 | +3.72*** | 57,49 | 54,77 | +2.72*** |
| 12-11 | +57.37 | +63.0 | -5.63*** | +62.73 | +62.93 | -0.20 | 63,7 | 62,6 | +1.10*** |

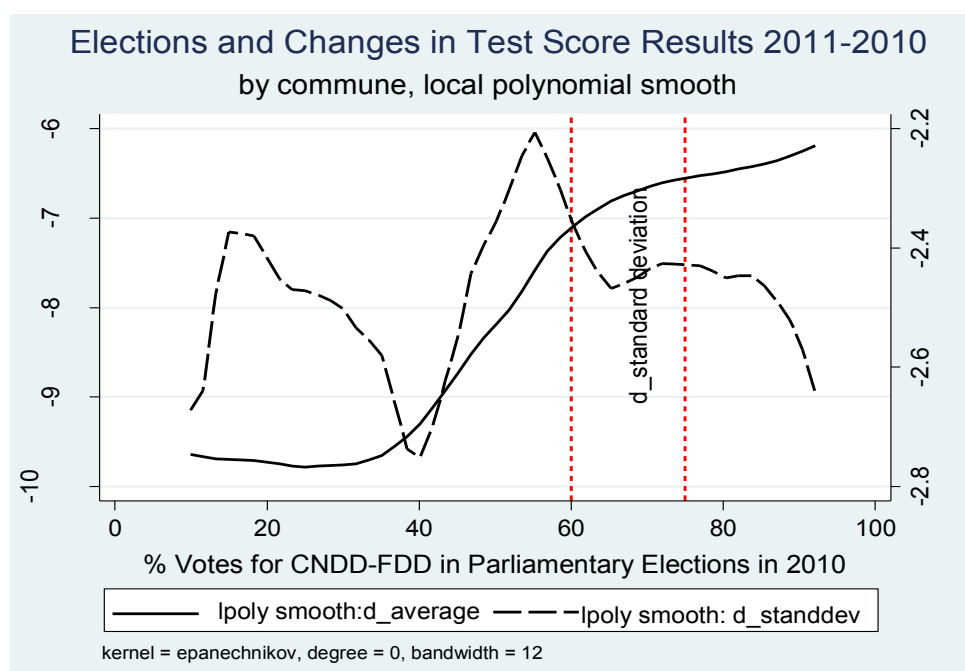
(a) Consists of the municipality of Mwumba and 8 other municipalities and (b) Consists of the province of Ngozi and its neighboring provinces Kayanza, Karusi, Muyinga and Kirundo.

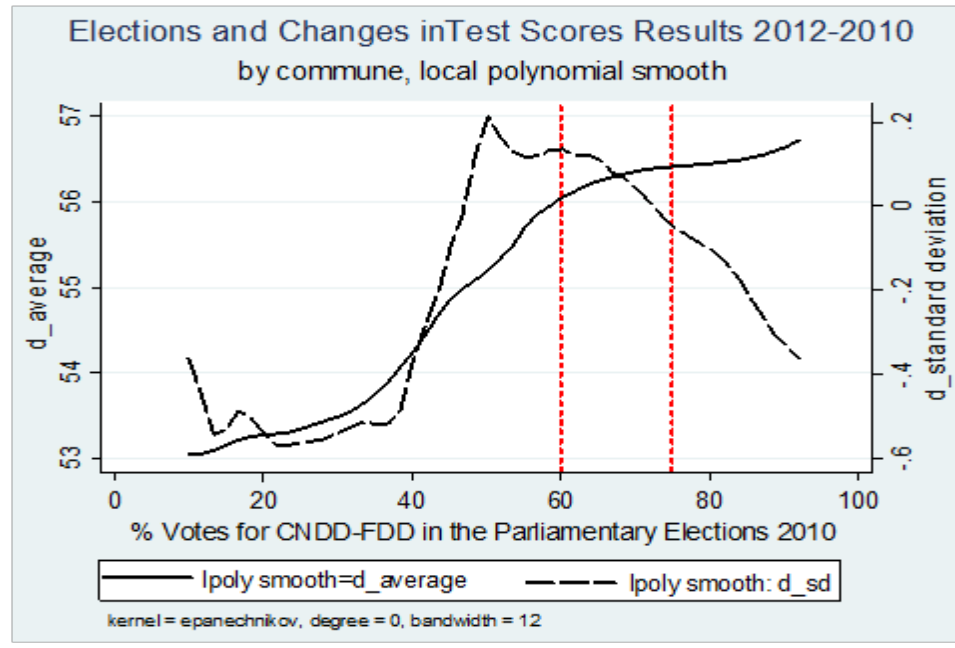
2010) and for 2012 (compared to 2010) respectively. The solid line in the graph is for the average, the broken line is for the standard deviation. Both graphs show increasing average test scores and decreasing standard deviations in municipalities with a high % of votes (60% or more) for CNDD-FDD.

Table 9(b): Test score standard deviation, Difference-in-Differences Analysis of Mwumba Municipality, the Province of Ngozi ^(a) and the Northern Provinces ^(b) respectively, versus the rest of the country, N=2100

| N=2105 | Standard Deviation | | | | | | | | |
|--------|--------------------|--------|------------|-------|--------|-----------------|-------------------|--------|-----------------|
| | Mwumb a | Rest | Diff. | Ngozi | Rest | Diff. | Northern provs | Rest | Diff. |
| | N=13 | N=2078 | | N=132 | N=1968 | | N=618 | N=1482 | |
| 2010 | 21.26 | 22.77 | -1.51** | 22.67 | 22.77 | -0.10 | 22.88 | 22.71 | +0.17 |
| 2011 | 18.44 | 20.31 | -1.86** | 20.44 | 20.29 | +0.16 | 20.37 | 20.27 | +0.10 |
| 2012 | 19.54 | 22.67 | -3.12*** | 21.00 | 22.76 | -1.76*** | 22.23 | 22.82 | -0.60*** |
| Diff. | | | Dif in Dif | | | Dif in Dif | | | Dif in Dif |
| 11-10 | -2.82 | -2,46 | -0.35 | -2,23 | -2,48 | +0.26 | -2,51 | -2,44 | -0.07 |
| 12-10 | -1,72 | -0,1 | -1.61*** | -1,67 | -0,01 | -1.66*** | -0.65 | 0,11 | -0.77*** |
| 12-11 | 1,1 | 2,36 | -1.26*** | 0,56 | 2.47 | -1.92*** | 1,86 | 2,55 | -0.70*** |

Fig 12 (a) and (b): *Changes in test score averages and standard deviation and the % of votes for the CNDD-FDD*





Similar identification strategy as before

We apply a similar analysis as in Section 5 of the paper, with the estimation strategy outlined in step 1 and step 2. Our dependent variables here are the test score average and the standard deviation. The average is the score obtained by the pupils from a particular school i from municipality j in one of the three years, or the standard deviation of the test score. γ is the year fixed effect to account for the particularities of each test year. As before, D is the proximity to the municipality of birth of the president and E is the election results for the 2010 parliamentary elections, obtained at the level of the municipality. The variable used is the % of votes obtained by the ruling party CNDD-FDD, and $E \cdot \gamma$ captures the interaction effect between the year of the test and the election results with β_2 our variable of interest. Finally, ε is an idiosyncratic error term.

As in the case of success rates before, we notice a statistically significant effect on the interaction between the year of the test (resp. 2011 and 2012 compared to 2010) with the proximity variable (in Table 10) and in the electoral variable (Table 11). Proximity to the president's municipality of birth or residence in a municipality with a high % of votes for the CNDD-FDD in 2010 leads to significantly higher averages on the test scores and lower standard deviations. Inclusion of time-varying controls does not change the results. There

are three things to note here: (i) in Columns 2 and 4, the interpretation of the sign of the coefficient is different as the base year is 2012; (ii) for these regression we only have a 3-year panel, not a 4-year one as for the success rates; and (iii) the lagged dependent variable in these estimations does not prove to be different from zero, which may lead us to consider the model with panel FE as our preferred specification. We come back to this question in the conclusion.

Table 10: Average and Standard Deviation of School Test Scores and Proximity to President's Municipality of Birth

| dep. var. indep.var | Average | | Standard Deviation | |
|------------------------------------------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | Panel FE | System GMM | Panel FE | System GMM |
| | Two controls exogenous | Subsidies Endogenous | Two controls exogenous | Subsidies Endogenous |
| <i>Lagged dep.v.</i> | | -0.01 (0.07) | | 0.03 (0.06) |
| <i>Year of the test</i> (2012 is base) | | | | |
| 2010 | - | - | - | - |
| 2011 | -7.89*** (0.26) | -62.91*** (0.61) | -2.55*** (0.11) | -2.90*** (0.23) |
| 2012 | 54.89*** (0.33) | - | 0.08 (0.14) | - |
| <i>Prox. to Mwumba</i> (all southern provinces=base) | | | | |
| All northern prov. except Ngozi (np) | - | 0.17 (0.61) | - | -0.26 (0.21) |
| Ngozi prov. (ng) except Mwumba | - | 4.71*** (1.10) | - | -1.69*** (0.36) |
| Mwumba Commune (mw) | - | 8.35**** (2.90) | - | -3.36*** (0.86) |
| <i>Interact. var.</i> | | | | |
| y2010*np | - | - | - | - |
| y2010*ng | - | - | - | - |
| y2010*mw | | - | - | - |
| y2011*np | 1.28*** (0.48) | -1.16** (0.48) | 0.06 (0.19) | 0.45* (0.24) |
| y2011*ng | 4.44*** (0.97) | -0.97 (0.93) | 0.48 (0.34) | 2.27*** (0.40) |
| Y2011*mw | -2.01 (2.39) | 5.67* (3.33) | -0.25 (0.96) | 1.56* (0.92) |
| y2012*np | 1.91*** (0.56) | - | -0.49** (0.22) | - |

| | | | | |
|--------------------------------------------------|----------------------------|------------------------------|--------------------------|--------------------------------|
| y2012*ng | 4.84*** (1.05) | - | -1.81*** (0.41) | - |
| Y2012*mw | -6.80** (3.17) | - | -1.87* (0.99) | - |
| <i>Control var.</i> | | | | |
| Cohort size | -0.07*** (0.01) | | 0.01*** (0.02) | |
| Subsidies | -0.01 (0.02) | -0.02 (0.06) | 0.01 (0.01) | -0.04 (0.04) |
| Constant | 77.78*** (0.80) | 128.35*** (4.74) | 22.07*** (0.19) | 22.77*** (1.53) |
| N observations | 5300 | 3597 | 5300 | 3597 |
| N groups | 1910 | 1897 | 1910 | 1897 |
| Test statistic | F(10,1909)= 11178.18*** | Wald chi2(9) =10617.02*** | F(10,1909) =111.30*** | Wald chi2(9) =654.36*** |
| Ar.-B. test for AR(1) in 1 st dif. | | - | | - |
| N of instrum. | | 11 | | 11 |
| Hansen-J test for overident. | | Chi2(1)=0.21 p-value=0.65 | | Chi 2(1) =6.05 p-value=0.01 |

Table 11: Average and Standard Deviation of School Test Scores and Electoral Results

| Model | <i>Average</i> | | <i>Standard Deviation</i> | |
|------------------------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| dep. var. indep.var | Panel FE | System GMM | Panel FE | System GMM |
| | Two controls exogenous | Subsidies endogenous | Two controls exogenous | Subsidies endogenous |
| <i>Lagged dep.v.</i> | | 0.05 (0.07) | | 0.01 (0.05) |
| <i>Y.of the test</i> (2009 is base) | | | | |
| 2010 | | - | | - |
| 2011 | -9.02*** (0.37) | -64.82*** (0.75) | -2.42*** (0.17) | -2.79*** (0.25) |
| 2012 | 55.04*** (0.44) | - | 0.18 (0.18) | - |
| <i>Election result</i> (<60% is base) | | | | |
| Medium | - | -2.80*** (0.62) | - | 0.39* (0.21) |
| High | - | -1.62*** (0.62) | - | 0.24 (0.23) |
| <i>Interact. var.</i> | | | | |
| y2010*med | - | - | - | - |
| y2010*high | - | - | - | - |

| | | | | |
|--------------------------------------------------|---------------------------|--------------------------------|-------------------------|--------------------------------|
| y2011*med | 1.86*** (0.51) | 1.60*** (0.55) | -0.11 (0.21) | 0.06 (0.26) |
| y2011*high | 2.70*** (0.49) | 1.28** (0.55) | -0.17 (0.20) | 0.45* (0.24) |
| y2012*med | 0.12 (0.58) | - | -0.26 (0.24) | - |
| y2012*high | 0.98* (0.57) | - | -0.63*** (0.23) | - |
| <i>Control var.</i> | | | | |
| Cohort Size | -0.08***(0.01) | | 0.01*** (0.01) | |
| Subsidies | 0.02 (0.02) | -0.05 (0.06) | 0.01 (0.01) | -0.04 (0.04) |
| Constant | 77.88*** (0.78) | 126.73*** (4.67) | 22.07*** (0.19) | 22.93*** (1.48) |
| N observations | 5298 | 3596 | 5298 | 3596 |
| N groups | 1909 | 1896 | 1909 | 1896 |
| Test statistic | F(8,1908)= 13776.22*** | Wald chi2(7)= 102173.15*** | F(8,1908) =134.97*** | Wald chi2(7) =640.57*** |
| Ar.-B. test for AR(1) in 1 st dif. | | - | | - |
| N of instrum. | | 9 | | 9 |
| Hansen-J test for overident. | | Chi 2(1) =0.03 p-value=0.87 | | Chi 2(1) =6.31 p-value=0.01 |

Conclusion

This paper has documented and analyzed a case of ethnic favoritism in sub-saharan Africa. The current regime in power in Burundi, unhappy with the decade-old leadership of Tutsi in the education system, chose a drastic way to end their subordination. The results of the nationwide test that regulates admission to secondary school, the Concours National improved much strongly and in a statistically significant way in the municipalities where the party of the president, CNDD-FDD, obtained high electoral support compared to the municipalities with lower electoral support. This change in the results, measured by higher success rates in the test, as well as higher averages and lower standard deviations in the test scores, occurred in the years immediately following the elections (2010), with the municipalities closer to the municipality of birth of the president benefiting earlier.

Given the different number of years for which we have a panel (3 or 4 years), the properties of each of the econometric models used, and the results on the lagged endogenous variable, we present our preferred specifications in Table 12.

Table 12: Overview: preferred specifications

| | Proximity | Electoral Outcome |
|------------------------------|----------------------------|------------------------------|
| Success Rate | System GMM ('diff eq') | Difference GMM |
| | 4 years, 4 prox. Variables | 4 years, 3 outcome variables |
| | 18 instruments | 12 instruments |
| | Table 7a2, column 4 | Table 8a, column 4 |
| Average & Standard Deviation | Panel FE | Panel FE |
| | 3 years, 4 prox. Variables | 3 years, 3 outcome variables |
| | Table 10, columns 1 & 3 | Table 11, columns 1 & 3 |

The results do not bode well for Burundi, as we shown that the current regime was ready to sacrifice the essentially meritocratic system on the altar of ethnic favoritism. The policy to adjust the results of the Concours National in the period 2010-2012 are a consequence of the decision taken by the regime in 2005, abolishing the school fees in primary school. This led to a massive increase in school enrolment, in itself a decision that can be defended with strong, objective arguments. However, this led to overcrowded classrooms, two-shift teaching, etc. as the education system was unprepared to deal with such large increase. In addition, 5-6 years later these pupils, supported by their parents, wanted to continue into secondary school, as they know very well the value of such a diploma for getting a job outside of farming. In order not to disappoint his support base in the north, and fully explained by the “quid pro quo” model of ethnic politics, the regime secured access to secondary school for more pupils from the north than one could expect on a meritocratic basis.

The pupils who belonged to the cohorts who took the exam in the period 2010-2012 have now entered university. Is it a coincidence that in the period 2016-2018 we witnessed strong political interference in the university of Burundi in the capital by the current regime? The cohorts that entered primary school in 2005 continue to benefit from measures driven by ethnic favoritism throughout their entire school career. No doubt they will receive beneficial treatment on the job market very soon as well. They are indeed the sons and daughters of the current political elite.

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