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Hidden Redistribution in Higher Education

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Abstract

Low income countries, and in particular countries in Sub-Saharan Africa, have invested huge resources over the last 40 years in financing higher (university level) education, compared with the number of students at that level and with the corresponding expenditures for lower levels of education. I propose and test an elite capture hypothesis: that expenditure in tertiary education is partly used as a tool for redistribution towards the elites close to the political leaders. I find that this hypothesis can explain a substantial part of the within-country variation in expenditures levels.

Keywords: higher education, public expenditures, inefficient redistribution, Sub-Saharan Africa

JEL classification: H52, I22, O55, C81

1 Introduction

Most countries spend more, in per student terms, on higher education[1] compared to the lower levels of education. The ratio of yearly expenditures per tertiary student to expenditures per student at lower levels is, however, much higher in less developed countries, and disproportionately high in Sub-Saharan Africa: Glewwe and Kremer (2006) report that it was 198.5 in 2003, more than 100 times as high as in the average OECD country. The amount spent on each university student in Sub-Saharan African countries is disproportionate to GDP per capita, considering how this relationship looks like in the rest of the world (Figure 1).

Several explanations for this phenomenon can be advanced, and some are discussed later in the paper. But the main focus of this study is on the hypothesis that the extremely high levels of spending for tertiary education in African countries partly reflect patterns of *hidden redistribution*. This term is used to describe situations in which items of public expenditure or public projects are

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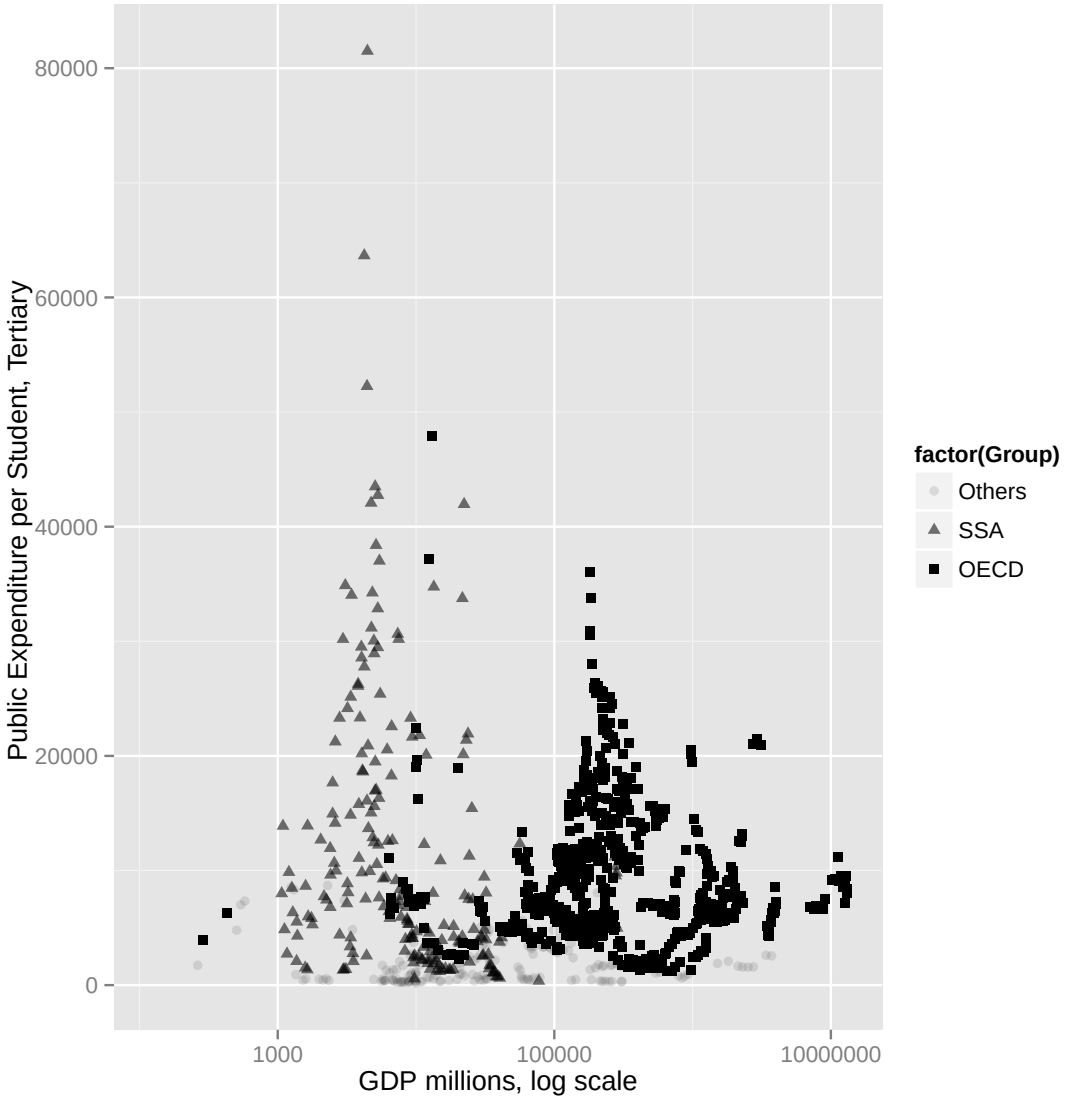
[1]While there is more international agreement on the definition of primary and secondary school levels, the types of schools and institutions that fall into the "higher education" category and the names given to them can differ considerably between countries. With "higher education", or "tertiary education", I refer to everything that comes after the secondary level.

Figure 1: Public expenditure per student at the tertiary level, Sub-Saharan Africa, other low- and lower-middle-income countries and OECD, 1960-2010



used as a disguise for redistributing resources to a particular constituency or special interest group. The premise of this argument is that, in these countries, higher education is not accessible to a large population base, and in some cases it is in fact markedly elitist.

Using an indirect method to construct long time series of university enrollment at the ethnic group level, I am able to observe the ethnic identities represented among students over time and relate them to the ethnicity of the political leader and the contemporaneous expenditure levels. Based on this strategy, I find that the hidden redistribution hypothesis can explain a substantial part of the within country variation in the level of expenditures. Leaders that belong to ethnic groups that are heavily represented among university students spend about 1,000 USD more per student enrolled yearly, about a third of the standard deviation of expenditure levels.

The remainder of the paper is organized as follows: in the next section, I refer to a theoretical framework to clarify when and why targeted redistribution is likely to take a disguised form. In Section 2.2, I will then motivate the particular choice of target groups on which this paper focuses, namely ethnic groups. Section 3 reviews some related literature. When it comes to the empirical strategy, Section 5 discusses the methodology used to obtain ethnic-level panel data and describes some interesting patterns that can be observed in these data. Finally, Section 6 presents the specification for the regression analysis and the results, and Section 7 concludes the paper.

2 Theory

2.1 Inefficient redistribution

Why should redistribution be disguised, in particular if this implies an inefficiency? In other words, why should a political leader or government that wants to redistribute resources to a particular group prefer the indirect ways of implementing potentially wasteful public projects? "[There must be] surely an easier way of accomplishing that objective!", notes Rodrik (1994), with reference to charges of hidden redistribution in trade policy.

In their seminal contribution, Coate and Morris (1995) summarize the political economy debate on the form of transfers to special interest groups, and introduce a model of political competition where politicians that want to benefit a particular group can choose between direct cash transfers and a disguised transfer mechanism. This consists of a public project that benefits the target group but also, under some conditions, the general population. Two elements are key in their set-up: (1) the citizens have limited information on the ex-ante conditions under which the project benefits them, and cannot observe even ex-post whether the implementation was in their interest because the outcome is stochastic; (2) there are two types of politicians, one that only cares for the general welfare (good type) and one that also cares for some particular group (bad type), and the citizens cannot distinguish between them. Under these fairly general conditions, politicians will sometimes prefer to transfer resources to the special interest group by implementing public projects, even though direct cash transfers would be more efficient, due to reputational concerns.

Just like in the model, high levels of spending in higher education may or may not be beneficial to society in general. They certainly benefit those that are currently enrolled, or that have the possibility to enrol, for the time of their studies. Such youths that completed the lower levels, and are able to afford the higher education are often a restricted group, and not necessarily representative of the general population in terms of socio-economic or ethnic background. Whether the benefits of this investment spill over, for those same individuals, beyond the time of study, and to the rest of the population depends on many other conditions, among which are demand for human capital in the

labor market, matching investments in physical capital, and not least an efficient and meritocratic system for access to higher education. However, what is crucial for the set up of the model is that these expenditures are *believed* to be beneficial. According to respondents to the Afrobarometer surveys, education ranks very high among the desirable attributes of a democratic society, even more than regular elections, majority rule, competing political parties, and freedom to criticize the government. Moreover, two-thirds (67%) of the respondents think that their governments are doing fairly well or very well at addressing their country's educational needs, and less than 10% think that the educational system faces widespread corruption problems.[2]

The second engine of the model are the reputational concerns that the politicians face. How should we think about the reputational concerns in this setting? Where do they come from? In some of these societies, the set of constraints and incentives associated with the electoral game is virtually or literally absent. Still, reputational concerns can come from elsewhere. These are highly heterogeneous societies, characterized by high ethnic fractionalization, see Table 1[3]. In cases of direct targeting, especially in combination with geographic segregation of groups, ethnic favoritism can lead to high regional inequalities and political instability, with long-term consequences being as dramatic as ethnic riots or civil conflicts (Easterly and Levine, 1997; Montalvo and Reynal-Querol, 2005). The political leader, even an autocrat, might face this threat if she were to openly discriminate, or favor, one particular group.

Table 1: Ethno-linguistic fractionalization and foreign aid by region

Region	ELF	ODA
East Asia & Pacific	0.57	0.20
Europe & Central Asia	0.49	0.02
Latin America & Caribbean	0.45	0.05
Middle East & North Africa	0.33	0.07
South Asia	0.47	0.09
Sub-Saharan Africa	0.66	0.20

Table 1 also shows that the share of official development assistance (ODA) to government expenditures averages 20.4% in Sub-Saharan Africa (SSA), and in some countries it exceeds 100%. Many of these countries are heavily dependent on their good standing with the international community, through many channels, one of which is development assistance. And many aid-giving institutions, the World Bank and UNESCO among others, encourage university provision in SSA countries, as a means to general aims such as expanding enrollment, preventing the brain drain and laying the basis for the scientific R&D sector. Recently, the Inter-American Development Bank suggested in a report that increased access to higher education could be a route to reduce inequality in Latin America. More generally, as expenditure items are concerned, investments in higher education, even in excess of levels that would be "optimal" from the perspective of the society, certainly meet less opposition from aid-giving institutions than open group-level redistribution.

Although most of the countries in SSA and in my sample have a presidential constitution and the President is a strong power, it would be ideal to know the ethnic composition of the government and the parliament, or the political body having the decisional power in terms of budget allocations. The way in which education systems are financed necessarily varies between countries, and this reflects

[2]As a reference, about half of the respondents think that corruption practices are common among civil servants and public officials, and only 47% expressed trust in the police.

[3]The measure shown, ELF, is the widely used ethno-linguistic fractionalization index by Roeder (2001).

on the actual possibility, or lack thereof, of political discretionality in the allocation of public funds. The hypothesis tested here is of a "reduced form" nature, investigating the link between political will at the top and resource allocation, omitting the details on the specific processes that lead to this result. The conclusion points to what the data show, namely that there is indeed an average effect and allocations to higher education do increase in connection with the redistribution hypothesis.

Summing up, this is the hypothesis we are testing: due to electoral concerns, threat of social unrest, pressure from international actors, and related motives, political leaders may be using public expenditure on higher education to benefit special interest groups. The next section will discuss the specific choice of group on which this study focuses.

2.2 Ethnic politics

It is easy to list reasons why political support to a leader is often organized around ethnic identities. An ethnic group is typically easy to mobilize, due to language and kinship ties, while at the same time the ascriptive nature of ethnic identity limits the size of the group in a natural way and partly screens opportunistic behavior. Moreover, from the individual supporter's perspective, ethnicity can be used as a proxy for the candidate's preferences, otherwise imperfectly observable, and this might give the coethnic candidate an edge over an opponent of different ethnicity.

On top of these theoretical arguments, there is a very practical perception of material benefits that can arise for a group when coethnics hold political power. The belief that people benefit from patronage in such situations emerges from politicians' rhetorics, and from the observed patterns of voters' support, besides a few conspicuous examples (see Kasara, 2007). Founded or not, this is a very widespread belief in many African societies. It is often argued that African leaders use public expenditure to support individuals from their region of origin or that share their ethnicity.[4] But why would a leader target her own coethnics for benefits? Theories are discordant on this point. On altruism or reciprocity grounds, holds the *core supporters* or *pure patronage* hypothesis: the leader derives indirect utility from benefiting her coethnics. Alternatively, she might feel she "owes" her position in power to her supporters, who hence must be retributed. Moreover, it is easier for the leader to please her coethnics, due to better information on their preferences, and better contacts and intermediaries among the group. On the other hand, it might be more politically efficient to target others than core supporters. In a standard probabilistic competition model (Lindbeck and Weibull, 1987), if voters derive "psychic" benefits from having a coethnic in power, their vote becomes cheaper in terms of material benefits, so they need to be rewarded for their support less than others.

This is ultimately an empirical question, and a few attempts have been made to assess it, some of which are discussed in the next section. By linking elite groups and ethnicity, the specific approach of this paper offers one more ground for evaluating the conventional wisdom on patronage politics in Africa.

3 Previous literature

> "In the case of Sub-Saharan Africa, economic growth is associated with low schooling, political instability, underdeveloped financial systems, distorted foreign exchange markets, high government deficits, and insufficient infrastructure. Africa's high ethnic

[4] Posner (2005) and Bates (2008).

fragmentation explains a significant part of most of these characteristics." (Easterly and Levine, 1997)

Ethnic diversity has become a very popular right-hand-side variable. A large literature connects it to a wide range of outcomes. A substantial number of studies lets the link work through politics, and ethnic favoritism in particular. This work has been relying on the theoretical arguments and the anecdotal accounts referred to in the previous section. Only recently there have been some attempts to empirically assess ethnic favoritism. FRANCK and RAINER (2012) relate the individual probability of completing primary school or losing a child aged below one to the contemporaneous rule of a coethnic. They find that respondents whose primary school years fully coincided with the rule of a coethnic leader were 2.25 percentage points more likely to attend and 1.8 percentage points more likely to complete primary school. Moreover, they find that children born during their mother's coethnic rule were .37 percentage points less likely to die during their first year of life. However, they do not convincingly address the endogeneity of changes in leadership. This means that the improved outcomes for the group might in fact precede or cause the group's success in politics, or the two phenomena might be jointly determined by some third factor. Kudamatsu (2009) exploits a plausibly exogenous change in the leader's ethnicity for Guinea 1984, and finds no effect on infant mortality.

Although they reach different conclusions, there is a common point in these two approaches: they focus on outcomes at the population level, by-passing the implicit link through policies. This is not completely straightforward in the case of outcomes such as school participation, that require many levels of individual choices and incentives. The authors argue that the relatively better performance of the leader's coethnics with respect to primary education must reflect a relatively higher quality or quantity of services provided to them by the public sector. However, the effect identified cannot be distinguished from a pure participation response in the population. Seeing a member of one's ethnic group reaching the top leadership of the country may inspire and motivate, give a perception of better future prospects and, for these reasons, induce higher participation in school, somewhat like the so-called Obama effect[5] in the US.

It is more straightforward to say something about ethnic favoritism by looking directly at policies rather than outcomes. Moser (2008) divides the ethnic groups of Madagascar into *swing*, *supporting* or *opposing*, with respect to the two presidential candidates in the 2001 elections, and examines the district allocation of public projects. He finds some evidence of both swing- voter targeting, according to the public choice theory, and ethnic patronage, depending on the type of projects. Burgess et al. (2011) find that the President's district of birth received an additional 46.33 km of paved roads every three years in Kenya, over the period 1961-1992. Kasara (2007) instead shows that African leaders tax their coethnics more heavily. This result is interpreted in the spirit of swing-voter targeting: the politician does not need to favor *core supporters*, for example coethnics, who would vote for her anyway, and can even extract surplus from them via taxation to instead benefit groups that would not support her without a *quid pro quo*.

The approach of this paper is similarly related to policy. An important difference is that I look at a public good that is not targetable to a specific district or group. It is often argued that clientelistic redistribution via public goods is politically inefficient, because it does not allow to distinguish between supporters and dissidents (Bates, 2008). A public good such as higher education is beneficial, at least in theory, to the general population, and is more easily tenable against charges of favoritism. In practice, though, given the accessibility of this level of education

[5]Marx et al. (2009).

and the actual ethnic composition of students, in some cases such a public good can become a form of *de facto* targeted transfer.

The empirical methodology I use is closely related to that used in FRANCK and RAINER (2012), as will be detailed in the next section.

4 Data

To test the hypothesis, one would ideally like to know the ethnic composition of tertiary level students in every country and year. Unfortunately, there has been no collection of panel data at the ethnic-group level. Therefore, I use an indirect method to retrieve this information, starting from the Demographic and Health Surveys (DHS). The DHS are publicly available nationally-representative household surveys that provide data for a wide range of indicators in the areas of population, health, and nutrition. I use the information on ethnicity, attained education and age in the DHS to predict the share of each ethnic group in the total number of students, by country and year. In other words, I proxy the ethnic composition of students in different years with the composition of different age cohorts in the survey. For example, to predict the number of university students belonging to ethnic group j in 1980, I use the number of respondents that in the survey year, f. i. 2006, are between 44 and 51 of age (18 to 25 back in 1980), belong to group j and report to have been enrolled in tertiary education. I do the same for all three levels of education, and also for a number of occupations that are in some sense closer to the public sector: civil servants, education professionals, police and military.[6]

These projections deviate from the actual shares for a number of reasons. The survey sample is representative of the population in the survey year, but there is no guarantee that each age cohort is equally representative. Moreover, we only know if a respondent has attended tertiary education, but we do not know where[7]: this can potentially induce systematic biases in connection with the patterns of political power. I will discuss this later, after presenting the specification. The information on ethnicity, which is not present in all DHS surveys, limits the sample to 28 countries. Table 2 reports the period covered for each country, i. e. the period for which at least some respondents are in the age bracket 18-25, given that there are at least 30 respondents. There is an average of about 9 ethnic groups represented among respondents in each country which, over an average of 34 years per country, generates about 8500 observations.

[6]The civil servants heading includes government officials and MPs, when applicable, as well as administrative and bureaucratic personnel; the education sector includes teachers and administrative or other support staff, although for this category I cannot distinguish between public and private schools; finally the last group includes police and military personnel. The occupation classification from the DHS can differ between countries, and some of these categories are missing in some countries; the shares computed in this way should hence be viewed as approximations.

[7]We do not know when, either. I assume that all respondents attended university when they were between 18 and 25.

Table 2: Time period covered, ethnic groups in power, number and type of transitions

Country	Period covered		Total groups	Groups in power	Changes in power	Violent transitions	Dem transitions	Leader from dominant group
Benin	1973	2010	7	2	6	5	3	7
Burkina Faso	1974	2011	10	3	7	5	1	30
Burundi	1993	2011	1	2	3	6	1	0
Cameroon	1971	2011	25	2	2	0	1	21
Chad	1994	2001	9	4	4	3	1	14
Congo, Dem. Rep.	1976	2011	7	2	2	3	1	0
Congo, Rep.	1975	2008	20	4	5	4	2	0
Ethiopia	1967	2011	19	3	4	3	1	53
Ghana	1963	2011	11	5	6	5	4	20
Guinea	1969	2004	6	2	2	1	1	40
Kenya	1968	2011	12	2	3	1	2	35
Lesotho	1975	2011	1	1	1	4	1	0
Liberia	1977	2009	1	4	7	4	2	0
Malawi	1978	2011	9	3	3	0	3	23
Mali	1973	2010	10	1	1	2	1	39
Namibia	1970	2011	8	1	1	0	1	4
Niger	1976	2004	7	3	3	3	3	35
Nigeria	1965	2011	10	4	9	6	4	5
Rwanda	1977	2011	2	2	2	2	1	0
Senegal	1967	2011	8	2	2	0	2	30
Sierra Leone	1982	2011	7	3	5	7	3	11
South Africa	1969	2004	3	2	2	1	2	32
Sudan	1979	1986	1	1	1	4	0	0
Swaziland	1977	2010	1	1	1	0	0	0
Tanzania	1977	2008	1	3	3	0	2	0
Togo	1976	1997	4	2	2	3	2	14
Uganda	1974	2011	14	5	6	6	2	0
Zambia	1967	2011	32	3	3	2	3	12

Notes: "Period covered" refers to the years in which at least some respondents are between 18 and 25 year old. A "dominant" group is an ethnic group whose share in tertiary students exceeds an equal share. A power change is defined as democratic if there was a contested election, according to the coding by Cheibub, Gandhi, and Vreeland (2010). Violent changes are coded according to data on coups from INSCR.

In the table, the predicted data are combined with information about the ethnicity of the leader in power, defined as the President, or the head of a Cabinet, or an autocratic leader, from Fearon et al. (2007). Their sources include country histories, general and country-specific reference works, press reports, government websites and official biographies. As mentioned above, it would be ideal to know the ethnic composition of the government and the parliament, or the political body having the decisional power in terms of budget allocations. This information is not currently available, although a large collection project is in progress (Francois et al., 2012).

According to the information about the leaders, there were at most nine changes in power for any given country during this period. Only a few of them occurred under democratic rule: I consider this to be the case if democratic elections were held, allowing parties outside of the regime front, according to a new dataset by Cheibub et al. (2010). Many of the power transitions, on average almost three per country, happened as coups or in connection with violent incidents.[8] As for the ethnic identity of the leader, in six countries (15% of observations) it never changed over the whole time period; for the remaining countries, up to five different groups were in power during the period considered. Finally, the last column in Table 2 report information on how often the leader belongs to an ethnic group that I call *dominant*. *Dominant* is a group that has a larger than equal share of university students, or a plurality.

Table 3 shows the shares of different groups that are enrolled in the three levels of education and employed in the three occupational categories on average during the sample years. In the first panel, ethnic groups that have never been in power are contrasted with groups that have been in power at least once. For the latter, the second panel shows separately the averages for the years when they were in power against the years when they were not in power. Finally, the third panel compares the dominant groups to all other groups. For example, the top-left cell says that, on average over the sample years, the share of primary students that belong to groups that have at some point been in power is 15% higher than the share of groups that have never been in power; and so on. The stars indicate that most of the differences, all positive, are significant at conventional levels, except the differences between being currently in power or not.

Groups that have been in power at least once seem to on average have more civil servants, more employed in the education sector and military personnel, beyond being more represented at all education levels. The shares of the dominant groups in the three education levels and the three occupations also differ significantly from the shares of the non-dominant groups; this suggests that obtaining a significantly larger share of public sector occupations is at least associated with being a large group in higher education. But it might also just depend on the fact that these groups are larger in the population in general.

The simple averages reported in the table pool together groups that belong to different countries and are observed at different points in time, and hence do not make use of the panel structure of the data. Figure 4 and Table **??** show the estimates from a distributed lags model of the population shares in the three education levels and occupational categories. The econometric model estimated is the following:

$$Share_{jit} = a_0 + aP_{it} + \sum_{k=1}^{5} b_k Lag_{kit} + \sum_{k=1}^{5} c_k Fwd_{kit} + \mu_i + \nu_t + \lambda_j + \epsilon_{jit}, \tag{1}$$

where P_{it} is a dummy for the group being in power in country i in year t while Lag_{kit} (respectively, Fwd_{kit}) is an indicator taking the value of 1 if the group was in power k periods ago (is going to be

[8] This information comes from the Integrated Network for Societal Conflict Research.

Table 3: Shares of enrolled or employed in the relevant age group (mean and sd) for different ethnic groups

	(1) Primary	(2) Secondary	(3) Tertiary	(4) Civil servants	(5) Educ sector	(6) Police/military
EverinPower	0.148***	0.152***	0.150***	0.109*	0.181***	0.173**
	(0.0224)	(0.0227)	(0.0227)	(0.0373)	(0.0376)	(0.0326)
Not_Ever	0.0474	0.0473	0.0471	0.132	0.0756	0.159
	(0.00720)	(0.00730)	(0.00738)	(0.0214)	(0.0200)	(0.0360)
Observations	8619	9600	10185	2989	3036	814
Power	-0.00265	-0.000703	0.0120	0.0171	-0.0383	0.0105
	(0.0405)	(0.0327)	(0.0292)	(0.0378)	(0.0497)	(0.101)
Not_Power	0.197	0.202	0.194	0.250	0.275	0.333
	(0.0344)	(0.0319)	(0.0274)	(0.0430)	(0.0472)	(0.0713)
Observations	1293	1357	1374	700	484	273
Dominant	0.153***	0.161***	0.173***	0.164***	0.140***	0.169*
	(0.0183)	(0.0188)	(0.0192)	(0.0253)	(0.0282)	(0.0558)
Not_Dominant	0.0278	0.0260	0.0231	0.0868	0.0587	0.127
	(0.00387)	(0.00384)	(0.00352)	(0.0188)	(0.0167)	(0.0375)
Observations	8619	9600	10185	2989	3036	814

Standard errors in parentheses

Notes: Shares of the population in the relevant age belonging to a specific group. The stars indicate that the difference in shares within a panel is statistically significant.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

in power k periods from now) *given that* it is not in power in year t. Hence, a is the average change in the share across all years when the group is in power, relative to the average change in other groups' shares in the same country and year (the equation includes country-, year- and group-fixed effects μ_i, ν_t and λ_j).*Each*b$_k$ and c_k instead represent a placebo test for the periods when group j is not supposed to differ from other groups in the country, on average, in terms of the change in the group's share of a particular level of education or occupation, because it is not in power. All these coefficients are expected to be 0.

The figures show that the annual change in a group's members that participate in a given level of education is not significantly different in the years when the political leader is a coethnic as compared to other groups within the country. However the group's share among the employed in the three sectors identified as close to the political sphere does show some indication of increasing during those years. Table 4 also confirms these patterns. These results, that extend the recent findings in FRANCK and RAINER (2012), are meant to be suggestive about the presence and extent of "ethnic politics" in general, showing whether people actually react to having a coethnic in power, and whether they benefit from it, for example in terms of occupational prospects. They do not tell the whole story in terms of ethnic favoritism, though, as discussed above, because they might come entirely from a response of the population to the change in leadership, without any actual change in policies (although this is more true for enrollment in education than for the occupations we examined). Hence, we now move back the focus from population outcomes to policies, namely the pattern of (over-)spending in higher education.

4.1 Other data sources

The data on public expenditures, enrollment, school age, in the period 1970-2008, are from UNESCO's EdStats. Table 5 reports the summary statistics at the country level. These data are not complete and balanced over the whole time period: although the panel spans a 37-year period, there are only on average 8 observations per country. This limits what can be tested empirically; however they remain the most comprehensive data available. Figure 4.1 shows the cross-country variation of expenditures within SSA. Although, as shown in Figure 1, the levels are on average higher than in the rest of the developing world, Table 5 and Figure 4.1 show that there is a substantial amount of variation in expenditures across countries within SSA. Data on ODA, GDP and population, as well as the geographic classification, are from the World Development Indicators.

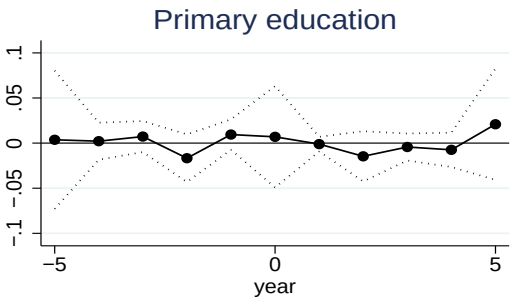
5 Method

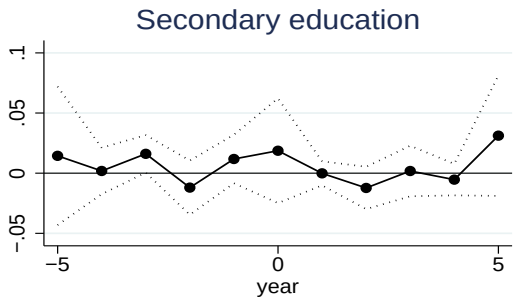
Figure 5 uses Kenya as an example of the variation that will be exploited by the regression model. The figure plots the share of tertiary students belonging to the two ethnic groups that alternate in power during this period: Kikuyu-Meru and Kalenjin. The expenditures pattern relates quite remarkably, in this case, to the rule of the two groups, which differ substantially in terms of student shares. Expenditures increase when the group with a higher share of students is in power, and fall under the rule of the other group.

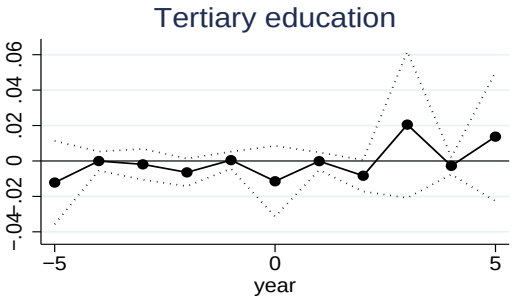
Formally, I estimate the following equation:

$$Exp_{it} = \alpha + \beta Z_{it} + \sum_k \gamma_{1k} pow_{kit} + \sum_h \delta_h x_{hit} + tr_{it} + \mu_i + \xi_{it} \tag{2}$$

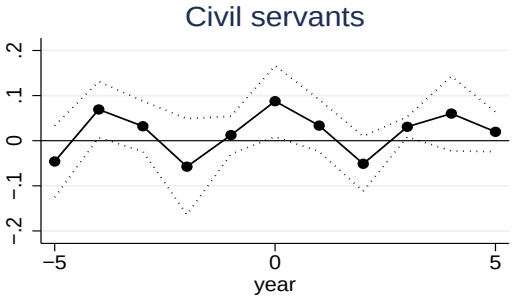
Figure 2: Shares of enrolled and employed for each ethnic group

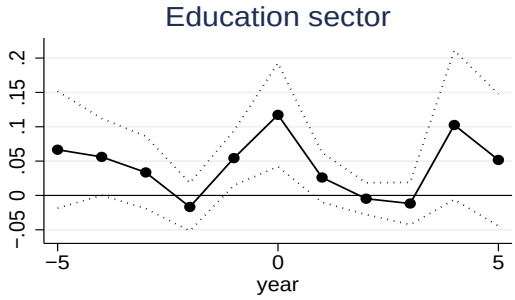


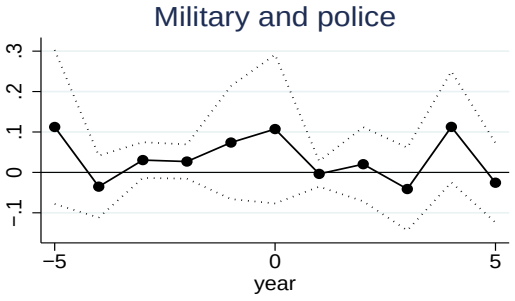




Notes: The three plots show the share of enrolled in each school level for the average ethnic group, in deviation from the group−year mean, over time. Year 0 denotes periods when the group is in power. Confidence intervals are based on standard errors clustered at the country level.







Notes: The plots show the share of the average ethnic group among the employed in each sector, in deviation from the country−year mean, over time. Year 0 denotes periods when the group is in power. Confidence intervals are based on standard errors clustered at the country level.

Table 4: Average shares of enrolled and employed over time

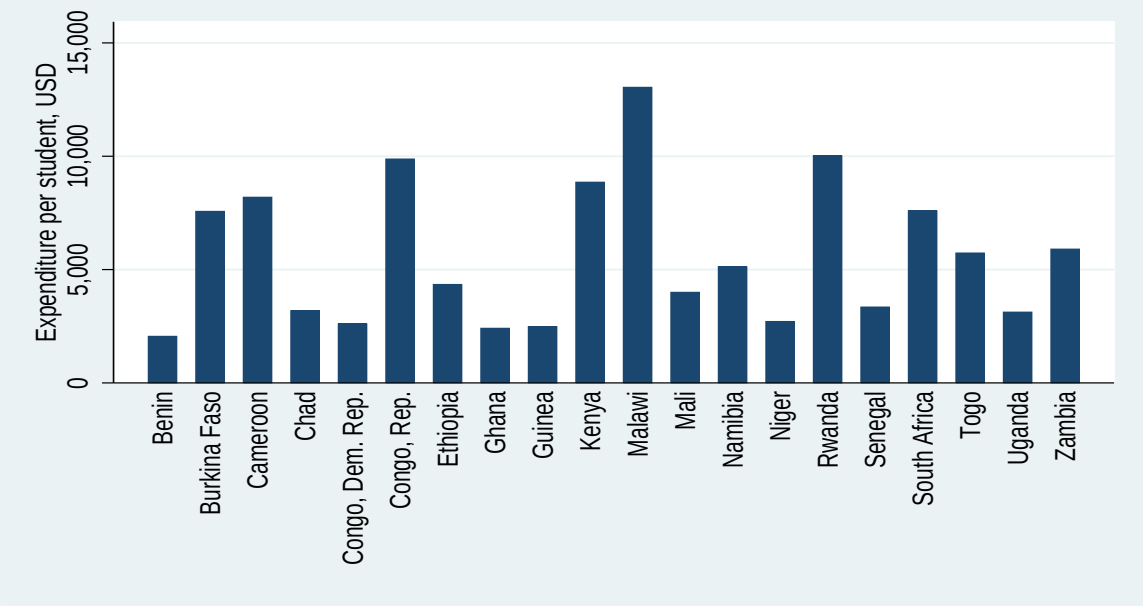
	(1) Primary	(2) Secondary	(3) Tertiary	(4) Civil	(5) Teacher	(6) Police
Power -5	0.00370	0.0144	-0.0122	-0.0461	0.0666	0.112
	(0.0375)	(0.0282)	(0.0115)	(0.0380)	(0.0397)	(0.0842)
Power -4	0.00213	0.00184	-0.0000204	0.0692**	0.0561**	-0.0353
	(0.0101)	(0.00944)	(0.00263)	(0.0298)	(0.0261)	(0.0339)
Power -3	0.00726	0.0161**	-0.00190	0.0321	0.0335	0.0305
	(0.00842)	(0.00764)	(0.00426)	(0.0268)	(0.0245)	(0.0195)
Power -2	-0.0167	-0.0120	-0.00643	-0.0576	-0.0167	0.0269
	(0.0129)	(0.0110)	(0.00382)	(0.0510)	(0.0163)	(0.0188)
Power -1	0.00951	0.0118	0.000485	0.0124	0.0544**	0.0739
	(0.00825)	(0.00987)	(0.00234)	(0.0201)	(0.0185)	(0.0619)
Power	0.00696	0.0187	-0.0114	0.0876**	0.117***	0.107
	(0.0275)	(0.0213)	(0.00977)	(0.0378)	(0.0351)	(0.0814)
Power +1	-0.00110	-0.000127	-0.000102	0.0336	0.0261	-0.00367
	(0.00395)	(0.00489)	(0.00243)	(0.0276)	(0.0168)	(0.0140)
Power +2	-0.0146	-0.0123	-0.00833*	-0.0511*	-0.00472	0.0202
	(0.0136)	(0.00861)	(0.00436)	(0.0292)	(0.0108)	(0.0405)
Power +3	-0.00431	0.00181	0.0205	0.0308***	-0.0117	-0.0411
	(0.00732)	(0.0103)	(0.0202)	(0.0107)	(0.0143)	(0.0453)
Power +4	-0.00744	-0.00535	-0.00275	0.0602	0.103*	0.113*
	(0.00931)	(0.00641)	(0.00236)	(0.0397)	(0.0506)	(0.0607)
Power +5	0.0209	0.0312	0.0137	0.0197	0.0517	-0.0256
	(0.0302)	(0.0245)	(0.0178)	(0.0211)	(0.0448)	(0.0435)
R^2	0.701	0.570	0.134	0.663	0.733	0.778
Countries	31	31	31	21	15	10
Observations	10266	10756	11226	2664	2897	830

Note: Dependent variable is the share of each ethnic group enrolled in the relevant school level, in columns (1)-(3), or the share of each ethnic group among the employed in the relevant sector, in columns (4)-(6). Standard errors clustered at the country level in parentheses. All the regressions include country and year fixed effects, so shares can be interpreted as deviations from the country-year averages. Lags and fwds are hence expected to be 0. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Public expenditures for education and enrollment in the sample

Country	Expenditures, % of GDP		Number of students, th.		Expenditures per student	
	Primary	Tertiary	Primary	Tertiary	Primary	Tertiary
Benin	.019	.007	1092	13	171	2060
Burkina Faso	.016	.006	1013	8	386	7572
Cameroon	.012	.007	2095	44	171	8196
Chad	.01	.003	1416	5		3194
Congo, Dem. Rep.	.005	.004		64		2604
Congo, Rep.	.021	.013	390	8	210	9881
Ethiopia	.011	.004	8447	53		4348
Ghana	.015	.008	2346	46	252	2415
Guinea	.008	.006	832	16	95	2482
Kenya	.032	.009	5945	35	335	8860
Malawi	.017	.009	2902	4		13046
Mali	.014	.006	961	12	165	4001
Namibia	.04	.008	384	12	1001	5122
Niger	.018	.003	881	4	182	2714
Nigeria	.006	.012	19661	378		
Rwanda	.02	.006	1796	10	80	10021
Senegal	.019	.011	1172	30	296	3351
Sierra Leone	.016	.006		4		
South Africa	.023	.01	7272	394	1205	7591
Togo	.017	.011	588	8	133	5735
Uganda	.012	.006	6728	29	105	3127
Zambia	.017	.007	2414	11	84	5907

Figure 3: Average public expenditure per university student, SSA

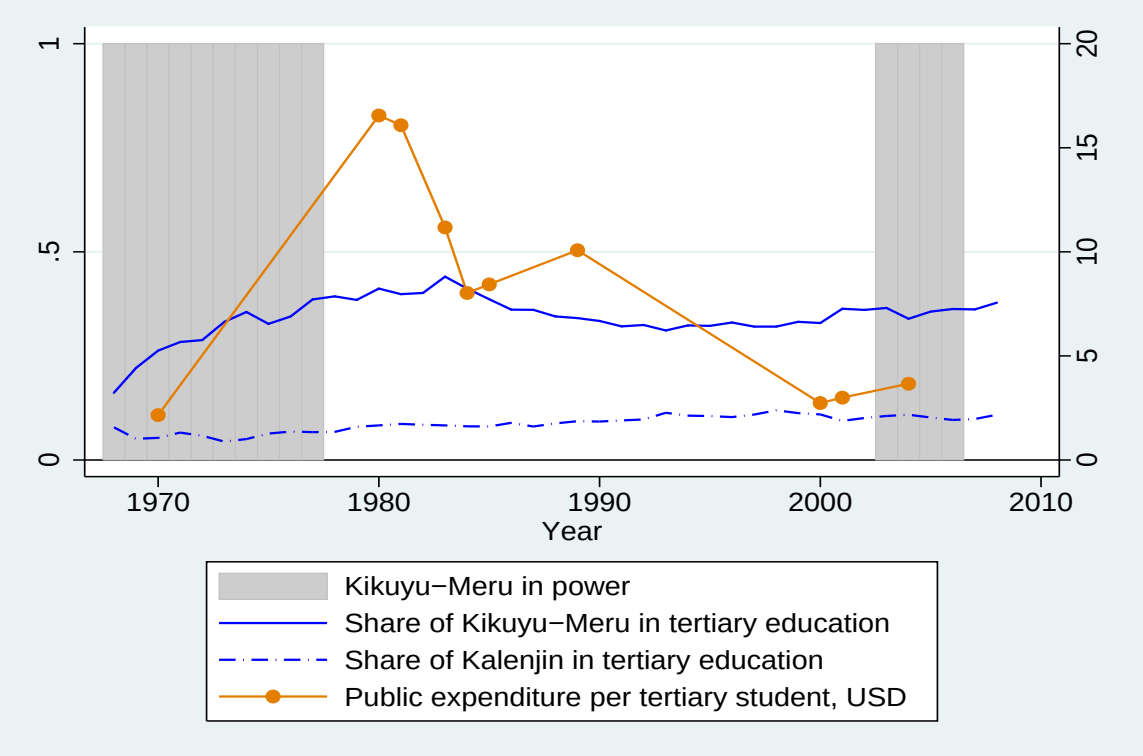


As dependent variable I use three measures of public expenditures in tertiary education in country i, year t: share of GDP, constant US dollars and constant US dollars per student. I use two alternative specifications for the variable of interest, Z_{it}. The first is an indicator that takes the value of 1 when the top political leader belongs to a dominant group, as defined above: a group with a larger than equal share of tertiary students. I also use the share of tertiary students that are cohetnic with the leader, interacted with the indicator for this leader being in power, in order to exploit all information in the sample. The control set x_{hit} includes GDP per capita, population and total expenditures in education as a share of GDP. Moreover, in all specifications, I include country- and year-fixed effects.

The identification of the causal effect of a "dominant leader" relies on the presence of indicators for all ethnic groups in power, pow_{kit}. In other words, Z_{it} compares the expenditure level of a group in power in the years when the group is dominant to the expenditure levels when the same group is in power but not dominant. This addresses a potential omitted variable problem, namely a group-specific preference for high education. If we observe high participation of group k in tertiary education (dominance), and high expenditures when the group is in power, this could simply be due to the fact that members of group i attach a high value to education: this group-specific preference would imply that, at the same time, more students from the group enroll in tertiary education, and leaders from the group spend more, without implying any redistribution. This effect is ruled out by the specification of equation (2).

All these indicators are based on my predicted data. As mentioned above, the predicted shares might be systematically biased in connection with the patterns of political power. For example,

Figure 4: Ethnic group in power, ethnic composition of students and expenditures in Kenya



if members of a minority group which is strongly discriminated against go to university abroad, this group would be overrepresented in my panels, and induce me to underestimate the fraction of students that belong to the leader's group, which is the main variable of interest in my analysis. This would push the estimate towards zero, leaving a "lower bound" interpretation for the coefficient. If, on the other hand, it is the leader's coethnics that go abroad more often when their group is in power, for example because it is easier for them to get scholarships or funding, this could confound my results and make them difficult to interpret, because I would overestimate the share of coethnics that actually are at the university. This issue is reasonably a minor one, though, as relatively few students go abroad to study,[9] and moreover I can almost certainly exclude that they are in the pool of respondents of the DHS.

[9] According to UNESCO, international students from all of Africa, at all levels, totaled 161,877 in 1999, which gives an upper bound estimate of 8% of all enrolled tertiary students. Even if all of them came from the leader's ethnic group, this would not change my results to any considerable extent.

6 Results

Table 7 reports the fixed effect estimations for the panel data on expenditures. A group that has more that an equal share of students in tertiary education spends on average 0.04% less of gdp on tertiary education when it is in power, but 0.05% more compared to itself, in periods when it is in power but not dominant. In absolute terms, this is about 36 million dollars less on average but 166 millions more in periods when the group is in power *and* dominant, or slightly more than 1,000 USD per student. The effects are just slightly bigger when focusing on countries where there are more groups than groups in power, i.e. where some of the groups are "excluded" from the alternance in power. If this phenomenon only happened in countries where all the different ethnic groups alternate in power, then over time it would generate an egualitarian distribution of public resources. Since instead it mostly happens in cases where some groups are excluded from power (it is almost always the case), this creates and amplifies inequalities.

1,000 USD per student correspond to about a third of one standard deviation in this variable. As mentioned, the regressions include dummies for the identity of the group in power to avoid a potential omitted variable, namely group-specific preferences about high education.

Table 6: Effect of dominant group being in power on three measures of public expenditures for tertiary education

	(1)	(2)	(3)	(4)	(5)	(6)
	% of GDP	USD	per student	% of GDP	USD	per student
Event1	-0.0412	-36.15	279.9	0.0478	166.5	1103.2**
	(0.0753)	(43.74)	(498.1)	(0.0730)	(122.7)	(519.1)
GDP	-3.25e-12*	-8.09e-09***	-2.73e-08	-3.88e-12**	2.67e-09	0.000000195
	(1.78e-12)	(1.33e-09)	(0.000000226)	(1.51e-12)	(2.13e-09)	(0.000000261)
Population	-1.85e-09	0.00000215	0.0000613	-4.83e-09	-0.0000151	-0.000117
	(9.14e-09)	(0.00000702)	(0.0000919)	(7.91e-09)	(0.0000204)	(0.000182)
Educ. Exp., % of GDP	0.193***	31.38**	833.9***	0.213***	4.872	646.1**
	(0.0292)	(11.34)	(219.6)	(0.0159)	(27.54)	(241.7)
Group_effects	NO	NO	NO	YES	YES	YES
R^2	0.639	0.461	0.727	0.773	0.628	0.821
Observations	208	160	146	208	160	146

Notes: All regressions include country and year fixed effects. Standard errors clustered at the country level in parentheses.

In order to exploit at best all the information in the sample, I also use in **??** the share of university students coethnic with the leader instead of the dummy variable. Although these results are not significant, the pattern of signs is the same. The size of the effect is as follows: a one standard deviation change in this share (15%) is associated with about half of a standard deviation change in expenditures per students (2130 USD).

Summing up, the empirical exercise in this paper identified an increase of about 1,000 USD in the level of expenditures per student in the years when a leader from a dominant group is in power. This is an actual policy choice by the leadership of these countries, and does not simply reflect a population response, as would an effect observed in participation. Moreover, the effect is

Table 7: Effect of dominant group being in power on three measures of public expenditures for tertiary education

	(1) % of GDP	(2) USD	(3) per student	(4) % of GDP	(5) USD	(6) per student
(mean) share_coe	-0.00322	-0.808	-68.51***	0.00929	27.14	142.0
	(0.00215)	(1.047)	(17.77)	(0.0143)	(19.16)	(96.58)
GDP (constant 2005 US)	-2.48e-12	-1.52e-08***	8.76e-08	-8.02e-14	4.07e-09	0.000000145
	(3.29e-12)	(6.10e-10)	(0.000000195)	(5.50e-12)	(6.90e-09)	(0.000000260)
Population	6.27e-09	0.00000780	-0.0000157	7.74e-09	-0.00000582	-0.0000190
	(7.58e-09)	(0.00000602)	(0.0000979)	(1.16e-08)	(0.0000156)	(0.000200)
Public.Edu.share.of.GDP	0.157***	15.76	698.0**	0.180***	16.00	656.6
	(0.0299)	(16.29)	(318.8)	(0.0255)	(18.77)	(404.9)
Group_effects	NO	NO	NO	YES	YES	YES
R^2	0.675	0.581	0.796	0.751	0.686	0.851
Observations	162	128	116	162	128	116

Notes: All regressions include country and year fixed effects. Standard errors clustered at the country level in parentheses.

not preference-driven. I can exclude, due to my specification, the case that group-specific values or cultural factors lead the group members to participate more and the group leaders to spend more on higher education. These 1,000 USD seem to be an actual transfer from a political leader to her group, because the group spends more when it is in power *and* dominant compared to when it is in power but not dominant. But how large is this transfer? How costly for society?

First of all, we might want to try and assess how costly this particular form of (disguised) transfers is for society, for example by comparing it to other documented instances. 1,000 USD per student amount to about 40 million USD per year in the average country.[10] In comparison, the effect identified by Burgess et al. (2011), a transfer to the president's district in the form of 46.33 additional kilometers of paved roads, can be converted, by their own estimates, to a monetary cost of 18.5 million USD every three years. Moreover, the disguised transfers in higher education amount to 1% of the average total budget for education, which is not very big but still a waste given the serious needs that most of these countries still suffer in the educational sector.

Under a different perspective, we can relate the identified source of inefficiency to the "anomaly" in expenditures observed in Sub-Saharan Africa as compared to other regions of the world, which was highlighted at the beginning of the paper. A back of the envelope computation allows us to visualize the importance of this source of variation over the whole period, and return to the inter-regional comparison. If the political leader was never of the same ethnicity as the dominant group in tertiary education, or if there was no dominant group in the first place, expenditures in higher education would on average be lower by 1,000 USD for every year in which the indicator takes the value of 1. This simulated lower level of expenditures is plotted in Figure 6 alongside the actual level. In cumulative terms, not very much of the SSA "expenditures anomaly" is accounted for

[10]However, this does not happen every year. The leader belongs to the dominant group only for about 16 periods in the average country, so the yearly amount of transfers is smaller, slightly more than 11 million USD, if smoothed over the whole period.

by this particular source of variation, only 5.6% (almost 8% within the smaller sample used for our estimations). Hence, more work is needed to shed some light on this fairly well known but surprisingly little explored puzzle.[11]

A number of alternative explanations can be proposed for future work. The most intuitive one is that setting up a higher education system requires some form of fixed cost that is at least partly independent of the number of students enrolled: from the physical infrastructure (buildings, labs, ...) to wages for faculty. Teachers' salaries in general are by far the largest component of government spending in education and, moreover, qualifications for this level must be relatively scarce in the population. The compensation must also be competitive against the high wages offered by international organizations, multinationals and the like.[12] Globalization of the labor market must also be pushing the standards for the education system upwards towards international levels and, with them, the costs. The enthusiasm of policy makers and international institutions for higher education, already referred to earlier in the paper, might also be a factor pushing upwards the investment levels, irrespective of the demand side (the number of students enrolled), maybe with the hope of also stimulating demand. It might also be the case that the amounts recorded as public expenditures for higher education do not, or do only partly, reach the intended objective. Reinikka and Svensson (2004) document diversions of public expenditures for primary education in Uganda; something similar might be also happening for the higher education level. Given the size of this inefficiency in public expenditure management, this issue might be woth further investigation.

7 Conclusions

This study advances and tests the hypothesis that the patterns of (over-)spending in higher education observed in SSA partly reflect disguised redistribution along the lines of ethnic favoritism. This hypothesis finds some support in the data, and accounts for a large portion of the within-country variation in expenditures levels. However, this result is limited to those countries where a specific ethnic group represents a plurality of the tertiary students, and a political leader belonging to the same group happens to come into power in some years. The hypothesis according to which this leader increases the expenditures on tertiary education to benefit her ethnic group can be distinguished from a pure participation response from the group itself and also from group-specific preferences for tertiary education. Although this particular mechanism is shown to play a role in the within-country pattern of expenditures, it does not contribute very much to explain the Sub-Saharan Africa expenditures "anomaly".

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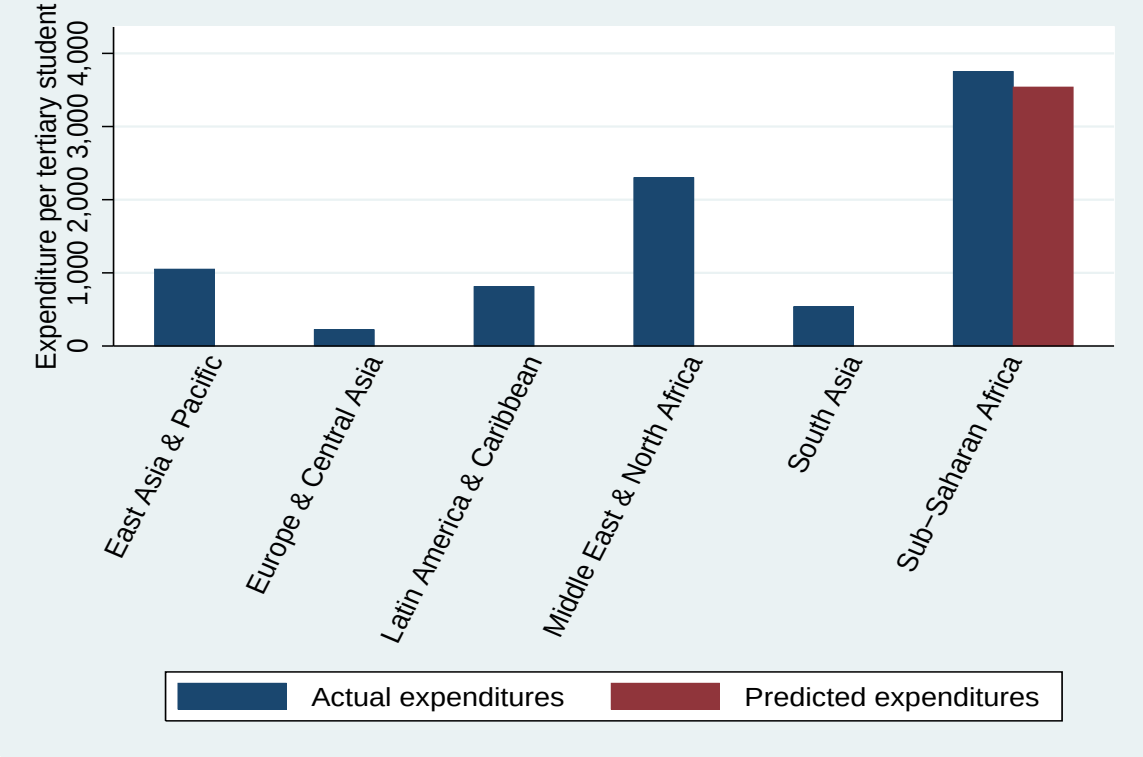
[11] The scarcity of data on this level of education probably lies behind the lack of studies.

[12] Political economy factors behind a high wage bill for teachers are proposed by Pritchett and Filmer (1999).

Figure 5: Actual and predicted expenditures per student across regions



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