Should competition authorities care about conglomerate mergers?[☆]

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Abstract

Mergers and acquisitions may change competition even when they do not affect market structure, a case known as conglomerate mergers. Competition authorities for a long time have adopted an ambiguous view towards conglomerate mergers, in particular those that are product or market extension mergers (i.e. acquisitions of local firm by a multiunit company that sells the same product in different geographic markets). In this paper, we explore a wave of acquisitions of Higher Education Institutions by educational groups in Brazil, which allow us to disentangle the effects of conglomerate mergers and of horizontal mergers on price, quantity and quality. Our findings show that multiunit organizations are able to increase some quality indicators. As for the effect on price and quantity, results are different. For conglomerate mergers we estimated an increase in the number of freshmen and tuition fees, whereas for acquisitions that leads to horizontal concentration there is no increase in quantity, just in prices. On the whole, our findings are consistent with the hypothesis that multiunit operations increase efficiency, due to scale and scope economies, but that only conglomerate mergers tend to pass on those gains to consumers. We find, though, heterogeneous effects according to the educational group, which still give some leeway for competition authorities to care about conglomerate mergers.

Keywords: mergers and acquisitions, conglomerate mergers, multiunit firms, higher education.

JEL codes: L22, L25.

1. Introduction

Standard merger analysis typically assesses its effects on price, quantity and, more recently, product characteristics due to changes in market concentration. However, merger and acquisitions may change competition even when they do not affect market structure, a case known as conglomerate mergers. Competition authorities for a long time have adopted an ambiguous view towards conglomerate mergers, in particular those that are product or market extension mergers (i.e. acquisitions of local firm by a multiunit company that sells the same product in different geographic markets) (Hovenkamp, 2005, p. 559). Such mergers are likely to benefit from scale and scope economies, but they also raise competition concerns due to the loss of potential competition and to enhancing the likelihood of anti-competitive conducts (Sullivan et al., 2015).

After a restrictive approach against conglomerate mergers until mid-1970's, merger policy in the US and elsewhere became more lenient with - or even silent about - mergers with no horizontal or vertical overlapping. More recently, there has been an increasing concern about product extension mergers due to tying and bundling strategies (Chen and Rey, 2015) and with the loss of potential competition in market extension mergers (Sullivan et al., 2015). In the same vein, the European Commission acknowledges the potential competition harm that can emerge from product or market extension mergers, but it still lacks a clear policy in this area, in particular with regard to the appropriate remedies (Neven, 2008). Hovenkamp (2005) even suggests that conglomerate mergers effects could be more effectively treated by means of conduct analysis rather than merger scrutiny. In short, it remains the question: should competition authorities care about conglomerate mergers?

In this paper, we address this question profiting from a wave of acquisitions of Higher Education Institutions by educational groups in Brazil, which allow us to disentangle the effects on price, quantity and quality of conglomerate mergers and of horizontal mergers that resulted from the same set of acquisitions. Between 2007 and 2014 the major educational groups in the country have acquired about 120 Higher Education Institutions (HEI) together with one million students. According to the last Brazilian Higher Education Census, private institutions are currently responsible for more than 75% of total higher education students, which amounts to 7.5 mi scholars. In addition to the large number of acquisitions, the Ministry of Education provides a number of indicators about all HEIs and respective courses within the country, which give us detailed information on HEIs and courses characteristics. Besides, we have a unique dataset containing the tuition fee for a large part of the courses offered in the country from 2007 to 2015.

Our identification strategy is based on a difference-in-differences (DID) estimation with many pre and post-treatment periods. We exploit the variation in the sociodemographic characteristics across markets and in the year of acquisition to provide a causal interpretation of the conglomerate

and horizontal effects through mergers and acquisitions. At first, we exploit the fact that 20% of the geographic relevant markets affected by the operations led to horizontal concentration. For conglomerate mergers we estimated an increase in the number of freshmen and tuition, whereas for acquisitions that leads to horizontal concentration there is no increase in quantity, just in prices. On the whole, our findings are consistent with the hypothesis that multiunit operations increase efficiency, due to scale and scope economies, but that only conglomerate mergers tend to pass on those gains to consumers.

There are also heterogeneous effects regarding educational groups, probably related to brand name positioning, although this latter conclusion is not robust. We also found that quality indicators that can be directly controlled by the educational group, like the percentage of teacher with PhD, increase after the acquisition, which suggests that educational groups are more responsive to regulatory constraints and/or use this to increase the perceived quality by the student body/candidates. We find evidence of a better students performance in the national exam following these hirings for some educational groups. However, we observed a change in the students profile, which make their performances not comparable over time. Our results also show that educational groups are also able to take more advantage than the other HEIs from government programs that promote access to higher education in private institutions and are beneficial for them, highlighting their skills to provide collective goods and spread their expertise for their units.

This paper relates to a recent study by Russell (2016), which analyzes 107 mergers between 2001 and 2013 involving public and private non-profit HEIs in the United States. Russell found that the average merger increases tuition and fees by 7% compared to non-merging institutions in the same state, and this result is consistent with the exercise of market power by merging firms. Although this result is similar to ours in qualitative terms, the estimated effects from both studies are quite different. Russell focus on horizontal mergers between public and private non-profit institutions, while we focus on market extension mergers. Thus, Russell measures the merger effect between non-profit organizations as a result of the change in the competitive pressure, while we measure the effect of becoming part of a multiunit organization through a non-horizontal acquisition.

This paper contributes to a large body of empirical research in Industrial Organization evaluating the effects of mergers and acquisitions on prices and quantity, which are primarily embodied by simulation models, such as Peters (2006), Nevo (2000), Hausman et al. (1994) and Werden and Froeb (1994). Weinberg (2011) evaluates the performance of these simulation models comparing predicted prices with retrospective estimates of the effect of the merger and Budzinski and Ruhmer (2009) present a review of the use of these models in antitrust analysis. In line with our empirical strateggy, Focarelli and Panetta (2003), Hastings (2004), Ashenfelter and Hosken (2010) and Friberg and Romahn (2015) have also adopted difference-in-difference regression in ex-post

evaluations of mergers.

A more recent literature evaluates the effects of mergers and acquisitions on products characteristics, emphasizing the repositioning effects in the horizontal dimension of differentiation, like Mazzeo (2002), Seim (2006), Gandhi et al. (2008), Watson (2009) and Sweeting (2013). Fewer studies assess the effects of mergers on quality, perhaps because it is harder to define empirically and to observe. Like Fan (2013), we are able to assess the merger effects in the vertical dimension of differentiation.

A common characteristic of all these papers is that they investigate the effects of a change in the competitive pressure resulting from the horizontal concentration. In other words, it is the merger effect from firms operating in the same geographic relevant market. In the cases we focus in this paper, there is no immediate change in the market structure as a result of the operation. For regulatory reasons that will be detailed later, the operations are mainly characterized by educational groups acquiring a HEI in a geographic relevant market where it does not have any branch. As only about 20% of the geographic relevant markets affected by the mergers have led to horizontal concentration, we are also able to explore the difference in the effects of horizontal and non-horizontal acquisitions.

This paper also contributes to the literature evaluating the entry effects of a chain, which is focused on the effects of the WalMart's entry. Basker (2005a), Hausman and Leibtag (2007) and Basker and Noel (2009) analyze Walmart's entry effects on retail prices. Matsa (2011) examines the relationship between the competition pressure caused by the entry and the quality of the supermarket stores. Jia (2008) assess the effects of WalMart's entry on the profitability and entry/exit decisions of competitors and Basker (2005b) on labor market. Holmes (2011) measure the scale economies in distribution costs afforded by the dense network of WalMart stores. As pointed earlier, this literature evaluates the effects of WalMart's entry in many dimensions, but is unable to disentangle the entry effect from the multiunit effect of a chain store in the relevant market.

The remainder of the paper is structured as follows. Section 2 provides background information about the Brazilian Higher Education Sector. Section 3 describes the dataset, section 4 discusses the empirical strategy and present the results and section 5 concludes.

2. Industry background

The higher education industry in Brazil has two very different types of institutions: the tuition free public institutions and the tuition funded private institutions. Public institutions select students through very competitive admission exams and, as a rule, have a better quality

than the private ones, except for a few high quality non-profit organizations. As the demand for public higher education is much bigger than its supply and the public vacancies have a timid growth rate, the private sector plays a key growing role in the industry.

Between 2000 and 2015, the number of HEI has doubled from 1,180 to 2,364, in which 88% are private institutions. Concerning enrollment in undergraduate courses, there has been an expressive increase even in the public sector: in 2000 there were 900,000 enrolled students, while in 2015 this number reached almost 2 million. However, the access to higher education was heavily boosted by the private sector: in 2000, 1.8 million students were enrolled in the private sector; in 2014, they were 6 million.

An important part of the growth of the private higher education is due to two large incentive programs promoted by the Federal Government, Prouni (Programa Universidade para Todos) and Fies (Fundo de Financiamento Estudantil). Prouni, created in 2004, provides full and partial scholarships in private institutions of higher education in undergraduate and some specific training courses for Brazilian students with no college degree. Fies, created in 1999 and largely expanded since 2010, is a program of the Ministry of Education that provides educational credit on attractive conditions for graduate students enrolled in private institutions. According to Federal Government, Prouni achieved 1.9 million granted scholarships in 2016, in which 70% are full scholarships, while Fies has benefited 2.5 million students since 1999.

Such growth in higher education has been responsible for a significant increase in the gross enrolment ratio[1], from 16% in 1999 up to 46% in 2013 (World Bank Data). However, it is worth noting that the higher education penetration in Brazil is quite low, even when compared to other Latin American countries. According to the World Bank, the gross enrollment ratio in higher education has reached 84% in Chile and 80% in Argentina in 2013. Therefore, there is great potential for an even greater enrollment expansion in the sector.

Higher education is highly regulated in Brazil. Supply expansion requires the fulfilment of a set of time demanding regulatory obligations that includes the accreditation of the HEI for entry and authorization to offer each course and the respective number of vacancies. Every new HEI must be accredited and request authorization for each new course. Larger accredited HEIs may have authonomy to open new courses in their current location, but an authorization is still need to open a branch in a new municipality. The legal deadline for accreditation of HEI and course permit is fifteen months. The same deadline is applied in the case of course authorization process requiring on-site evaluation, even if the HEI is already accreditated. If the course dispenses the

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[1]In higher education, the gross enrollment ratio is defined as the ratio between the total number of enrollments over the population aged from 18 to 24 years old.

on-site evaluation, the deadline is of eight months[2]. It is not allowed to transfer courses between HEIs.

The existence of such a complex set of rules and especially the time frame for the effective regularization stands as the main reason for the substitution of organic growth for mergers and acquisitions by private institutions in such scenery of strong demand growth. The regulatory requirement are the most relevant barriers to entry in the industry. Given the regulatory constraints, the acquisitions pose as a reasonably faster way to access new geographic markets and constitute an alternative expansion policy for the educational groups.

The 2007-2012 period was particularly active regarding acquisitions in the education sector as a whole, leading to the emergence of the educational groups. The groups Anhanguera, Kroton, Estácio, Laureate, Ser Educacional and Devry have performed the majority of the acquisitons previously mentioned[3]. Together, these groups have acquired around 120 HEI between 2007 and 2014, which amounts to almost 1 million students[4].

As part of a educational group, the acquired HEI can benefit from collective goods and multi-plant scale economies, such as standardized courseware, live video classes (which permits that a single professor gives the same lecture for multiple classes at the same time), replacement of part of classroom hours for online content[5], centralization of academic and financial management of all units of the group in a single shared services center and support structure for the students to obtain student loans. These are examples of the economies of scale and scope the conglomerate mergers are able to generate.

3. Data

In this section we describe the dataset and discuss our approach to measure the effect of becoming part of an educational group through a merger or acquisition.

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[2]The on-site evaluation in the course application may be dismissed if the HEI has a quality index of at least 3 (three), in a 0-5 scale, among other requirements.

[3]In May 2014, the Brazilian Antitrust Authority (CADE – Conselho Administrativo de Defesa Econômica) approved the merging between the groups Anhanguera and Kroton, giving rise to the world's biggest educational group in terms of students and market value. In July 2016, Kroton and Estácio have announced their merger, which is still under scrutiny by CADE.

[4]For the identification of the acquired HEI by educational groups we used mergers information from CADE. In those cases in which the operation was not submitted to the competition authority, we resorted to the HEI's and investors' websites.

[5]The regulation allows up to 20% of the hours of undergraduate courses to be online.

3.1. Data sources and dataset construction

We have compiled a unique dataset on the Brazilian higher education from 2007 to 2015 based on various sources. The Higher Education Census of the Ministry of Education provides information regarding institutions and courses by municipality, such as enrolled students, vacancies, freshmen, student loans and scholarships. The graduating students are evaluated by the Ministry of Education in a national exam (Enade - Exame Nacional de Desempenho dos Estudantes), which consists of a test of general knowledge common to all courses and a subject test for each course. The students also answer a socioeconomic questionnaire. The exam is held every year for different groups of courses and each course is evaluated every three years. For example, courses evaluated in 2007 were evaluated again in 2010 and 2013. In addition to the students' performance, the Ministry of Education provides other quality indicators of the courses, such as the percentage of teachers with a PhD degree and the percentage of full-time teachers. Our database also contains information on the tuition fee (sticker prices) for the most part of the courses, which was confidentially provided by the Guia do Estudante (Student Guide), from Abril publishing company. The Student Guide provides information about all Brazilian higher education courses for students that are willing to be become undergraduate students. Every year, the magazine asks the HEIs' tuitions for each offered course and publishes it in a 1 to 5 scale. Despite attendance is optional, HEIs are encouraged to provide complete and accurate information, since Student Guide is the most important guide for Brazilian undergraduate candidates. We also use demographics and labor market information on municipalities from the Brazilian Institute of Geography and Statistics (IBGE – Instituto Brasileiro de Geografia e Estatística).

As for the delimitation of the relevant markets, we follow the Brazilian Competition Authority, so as the public and private HEIs and online courses and in-class courses consist in different relevant markets. As a consequence, we just use the private sector and in-class courses information. Due to the fact that our dataset starts in 2007, we had to exclude those HEIs acquired in 2007, since we do not observe information prior to 2007. We also excluded all HEIs that were already part of an educational group, since these units are not a suitable control group. Therefore, our comparison group comprises the institutions that have never belonged to these educational groups. Our data set contains about 80% of all private HEI of the country and information on tuition fees for about 60% of all private undergraduate in-class courses.

Table 1 presents the frequency numbers for HEIs acquired by educational group and for acquisitions in which the group already had at least one unit at the municipality of the acquired HEI at the time of acquisition. The acquired HEI can have units in more than one municipality: for example, a single acquisition can mean horizontal concentration in just one of the geographic markets where the acquired HEI operates. As we are going to explore heterogeneous effects by group, we have excluded Devry and Ser Educacional groups due to the limited number of observations.

Table 1: Acquisitions by educational group, municipalities affected and municipalities where the acquisition resulted in horizontal concentration

Educational Group	Acquisitions	Geographic relevant markets	Horizontal mergers
Anhanguera	23	26	8
Kroton	32	44	4
Estácio	23	23	7
Laureate	7	11	2
Total	85	104	21

About 20% of the municipalities where the acquired HEIs operate has led to horizontal concentration. As we pointed earlier, the acquisitions were mostly intended to facilitate the entry into new geographic relevant markets by the educational groups.

3.2. The profile of the acquired HEI

We show a number of characteristics comparing the acquired (treated) and non-acquired (control) HEIs and its respective municipalities in the pre-acquisition (pre-treatment) period. These statistics are related to the year before the acquisition. More than three-quarters of the HEIs are observed at first time in the dataset in 2007[6]. If the HEI operates in more than one municipality we show the characteristics for the municipality where the HEI has the biggest number of enrolled students. Table 2 present the descriptive statistics.

The HEIs acquired by the educational groups differ in some aspects from the other HEIs. The acquired HEIs are larger in terms of enrollment and freshmen students than the other HEIs. The demographic and economic characteristics of the municipalities are also different between acquired and non-acquired HEIs, especially those characteristics related to the labor market. The acquired HEIs are in municipalities with a higher proportion of young people, higher wages per capita, higher proportion of formal jobs relative to the population, higher proportion of people with complete higher school in formal jobs, higher proportion of people in formal jobs in the service sector and a smaller proportion of people in formal jobs earning up to two minimum wages. These differences indicate that the choice of HEI to be acquired (selection to treatment) seems to be performed based on observable characteristics of the HEI and on the socioeconomic characteristics of the geographic market where the HEI is located.

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[6]There are two reasons for which we have an unbalanced panel, as some HEIs appear for the first time after 2007. First, they may have entered the market later than 2007 or there is no information available for the earlier period, such as tuition or IGC (new institutions take some time to be evaluated and have an IGC).

Table 2: Descriptive statistics and mean comparison between acquired and non-acquired HEI, pre-acquisition period

Variable	Treated				Control				Mean Diff
	mean	sd	min	max	mean	sd	min	max	
Enrollment	3,867	9,054	185	80,893	2,197	6,151	2	145,498	1670*
Freshmen	1,182	2,853	38	25,204	631	2,299	0	64,506	551*
Vacancies	2,591	5,233	100	41,030	1,341	7,050	0	251,615	1,250
Courses offered	10.306	9.919	1	48	7.316	9.109	1	74	2.990**
Share of the biggest municipality for HEI	0.975	0.103	0.361	1.000	0.983	0.095	0.000	1.000	-0.008
HEI share at the biggest municipality for HEI	0.165	0.222	0.001	1.000	0.273	0.342	0.000	1.000	-0.108**
Counties of HEI	1.224	1.169	1	11	1.281	4.260	1	162	0.058
IGC (HEI quality index, ranges from 0-5)	2.08	0.46	1.05	3.53	2.13	0.55	0.55	4.83	-0.05
Population (10^3)	1,764	3,161	45	10,990	1,431	2,823	3	11,038	333
Pop 18-24/Pop	0.136	0.016	0.096	0.209	0.132	0.013	0.093	0.228	0.004**
Wage Bill (annual per capita - 10^3)	5,995	3,473	798	15,333	4,895	3,724	198	22,777	1100**
Formal Jobs/Population	0.316	0.119	0.067	0.720	0.267	0.120	0.031	0.790	0.049***
% Formal Jobs w/ incomp HE	0.043	0.013	0.021	0.079	0.040	0.015	0.006	0.102	0.003
% Formal Jobs w/ complete HS	0.404	0.086	0.252	0.628	0.378	0.075	0.146	0.737	0.026**
% Formal Jobs in Service Sector	0.761	0.122	0.327	0.932	0.717	0.145	0.251	0.977	0.044**
% Formal Jobs up to 2 MW	0.468	0.133	0.244	0.761	0.517	0.148	0.197	0.896	-0.049**
N	85				1,522				

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4. Identification Strategy and Results

To assess the effects of the acquisition of HEIs by educational groups, we should observe the HEI indicators in the absence of the acquisition to compare with the indicators for the case in which the HEI was, in fact, acquired. To deal with this counterfactual problem, we employ a difference-in-difference (DID) strategy with multiple periods using a number of fixed effects controls. As shown in Table 2, the decision to acquire a HEI is related to some observable characteristics, especially those on municipality socioeconomic characteristics. To control for selection into the treatment we also combine the DID estimation with matching. First of all, we present our Probit estimation for the likelihood of being acquired. Then, we present our results for the DID estimation.

4.1. Determining the acquisition probability

As for the DID estimation with matching, in this first stage the goal is to find a control group that is comparable to the treatment group in terms of observed characteristics. Using a Probit model, we estimated the likelihood of each HEI to be acquired based on the observable characteristics using the institutions in the pre-treatment period. Our estimation results are shown in Table 3.

After testing a number of specifications, enrollment was not significant when the variable "authorized vacancies" is added. The number of courses offered is negatively related to the acquisition choice. The sociodemographic characteristics from each municipality also determine the acquisition probability, following our findings in the mean differences test presented in the Table 2. The proportion of young people, the wage per capita and the labor market variables were significant at explaining the acquisition. Combined, these data can be seen as an evidence that the educational group is, in fact, acquiring the license to operate in the geographic relevant market.

The match between the IES acquired and not acquired was performed by the Epanechnikov Kernel matching[7], imposing the common support condition. As suggested by Rosenbaum and Rubin (1985), we performed tests of differences of mean between the treated and control groups for each of the explanatory variables before and after matching. The null hypothesis is that the difference of means between treated and control is equal to zero. That was the case for all covariates. We present the mean difference tests in the Table A.1, in the Appendix. As for the Difference-in-Differences with matching estimation, we used the estimated weights for each HEI in this section as weights in the regression.

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[7]We have used a maximum bandwidth of 0.06 between the propensity scores of the acquired and non-acquired HEIs.

Table 3: Probit: determinants of treatment

Variable	Coefficient	SE
log Vacancies	0.594***	0.102
Nº of courses	-0.040***	0.012
HEI share in the municipality	-0.465	0.313
IGC	4.50E-04	0.132
Population(10^3)	1.90E-06	6.31E-05
Pop 18-24/Population	12.318**	5.711
Population of micro-region(10^3)	3.26E-05	2.38E-05
Population/Population of micro-region	-0.479	0.764
Wage Bill (annual per capita - 10^3)	-1.93E-04***	4.92E-05
Formal Jobs/Population	5.254***	1.125
% Formal Jobs w/ incomp HE	2.946***	1.063
% Formal Jobs up to 2 MW	-1.851**	0.907
% Formal Jobs in Service Sector	0.252	0.666
% Formal Jobs w/ complete HS	0.811	5.663
Northeast	-0.912***	0.270
North	-1.314***	0.340
Southeast	-0.958***	0.216
South	-0.906***	0.255
Constant	-7.035***	1.358
Obs.	1,590	
Prob > chi2	0.0000	
Pseudo R2	0.1945	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.2. Price and Quantity Effects

We start our analysis estimating the average treatment effect using a difference-in-differences equation, abstracting for the moment potential dynamic effects and heterogeneity in educational groups. Formally, we estimate an equation like the Equation (1) for price and quantity.

$$y_{jmt} = \alpha_j + \alpha_{mt} + \theta \mathbb{1}\{Treated_{jt}\} + \delta \mathbb{1}\{Overlap_{jmt}\} + \beta_1 y_{jmt0} T_t + u_{jmt} \qquad (1)$$

where y_{jmt} is the outcome variable (price or quantity) of the HEI j, in the municipality m, period t. $\mathbb{1}\{Treated_{jmt}\}$ is an indicator for whether HEI j is treated in the period t. $\mathbb{1}\{Overlap_{jmt}\}$ is an indicator for whether the acquisition increased the concentration in the municipality m. Then, θ measures the average market extension merger effect, while δ measures the additional effect for acquisitions that led to horizontal concentration. y_{jmt0} is the outcome variable in the first period in which it can be observable in the dataset, leading us to compare HEIs with the same initial condition for the outcome variable. We add HEI fixed effects (α_j) and year by municipality fixed effects (α_{mt}). By including year by municipality fixed effects we control for demographic and

socioeconomic municipality characteristics that could impact on HEIs performance. In addition to this preferred specification, we estimate simpler models with HEI, year and municipality fixed effects combinations and a specification matching HEIs including HEI fixed effects and year by municipality fixed effects. All standard errors are clustered at the HEI level.

Our price and quantity variables are defined as follows. The price is the log of the average tuition fee by course weighted by the number of the enrolled students in the course. The quantity variable is the log of the number of freshmen students in regular undergraduate courses. These price and quantity variables are for a HEI, in a municipality, in a given year.

Tables 4 and 5 show our results for tuition fee and freshmen effects respectively. In the first column we show the DID estimation with HEI and year fixed effects, in specification (2) we add municipality fixed effects, in specification (3) we use HEI and year by municipality fixed effects and in (4) we perform the DID estimation with matching and HEI and year by municipality fixed effects[8].

Table 4: Difference-in-difference estimates for tuition fee for undergraduate students

	(1)	(2)	(3)	(4)
Treated	0.045*	0.052**	0.081***	0.051**
	(0.025)	(0.023)	(0.031)	(0.030)
Overlap	0.039	0.011	0.008	0.010
	(0.055)	(0.051)	(0.058)	(0.055)
Obs	9,624	9,617	6,831	6,831
Groups	1,286	1,286	1,009	1,008
HEI FE	yes	yes	yes	yes
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Average estimates show very interesting results. All specifications show that market extension mergers increase tuition fees and freshmen undergraduate students. Adding municipality and year by municipality fixed effects increase the magnitude of the impacts. In our preferred model (3), tuition fees increase by 8% while freshmen increase by impressive 52%. Even more interesting is the fact that acquired HEIs in markets where the educational group already had a branch before the acquisition also increase tuition fees, as the *Overlap* coefficient is not statistically different from zero, but the impacts on the number of freshmen are diverse for market extension mergers

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[8]We are aware about the need for correcting the standard errors for the specification (4), where we have estimated the DID with matching using the propensity score estimated in a first stage. However, our estimated parameters are relatively close in all specifications, which made us comfortable in choosing specification (3) as our preferred.

Table 5: Difference-in-difference estimates for freshmen undergraduate students

	(1)	(2)	(3)	(4)
Treated	0.418***	0.500***	0.520***	0.490***
	(0.095)	(0.071)	(0.094)	(0.107)
Overlap	0.027	-0.417***	-0.436**	-0.564***
	(0.320)	(0.160)	(0.184)	(0.183)
Obs	13,362	13,344	10,157	10,085
Groups	1,528	1,528	1,247	1,246
HEI FE	yes	yes	yes	yes
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

and horizontally concentrated mergers. Actually, the test for $Treated + Overlap = 0$ for freshmen cannot be rejected at any significance level below 60% in specification (3). That is, for conglomerate mergers we estimated an increase in price and quantity, whereas for acquisitions that leads to horizontal concentration there is no increase in quantity, just in prices. These findings are consistent with the hypothesis that multiunit operations increase efficiency, due to scale and scope economies, but that only conglomerate mergers tend to pass on those gains to consumers through an increase in quantity.

4.2.1. Inferring causality from the dynamic of the effects

The fundamental assumption of DID estimation that leads to unbiased θ and δ estimates is that the treated group would have the same trend that the control group if it had not been treated, once deviations in the tendency of the treatment group compared to the control group trend are assigned to treatment. A common strategy to check this assumption is to look for the pre-treatment trends for the control and treatment groups. Unfortunately, we do not have information earlier than 2007, when the consolidation wave started, on tuition fees. Another strategy is to estimate an specification including leads and lags from treatment, instead of an average effect for the post treatment period, as the acquisitions unfolded over time. This approach also enables us to explore the dynamics of the effects, verifying how quickly they evolve and if they are sustainable over time.

Here, it is important to qualify how we constructed our treatment dummy variable through time. We have considered the HEI as treated since the approval date of the acquisition by the Brazilian Antitrust Authority, CADE, in cases in which the operation was submitted to the Antitrust Authority. When the acquisition was not submitted, we have considered the HEI as treated

since the official date of the acquisition as announced through media or disclosure of material act or fact. This is an imperfect measure, even with the mandatory merger control, which prevents the operation from closing until its official approval in case of submission. The merging parties can anticipate dealings, especially if the operation is likely to be approved without remedies. When a notification to the Antitrust Authority is not necessary, this issue can be even worse. However, we believe that it is unlikely that an anticipatory effect occurs for more than a year.

Specifically, to investigate the parallel trends assumption, we add indicator variables for 4 years and backward before adoption, 1-3 years before adoption, 1–5 years after adoption and year 6 forward. Of these ten indicator variables, the first one are equal to one starting with the fourth year before of adoption and backwards. The final variable is equal to one in each year starting with the sixth year of the acquisition. The other variables are equal to one only in the relevant year. Our basis period is the year of the acquisition. If there are no anticipatory effects and if we were able to soften the selection on observables problem, we should not find significant effects on leads, i.e., the treatment can predict the future of the y_{jmt}, but the treatment cannot predict a past y_{jmt}. If there are effects in the year of the official date of the acquisition, which is likely, our treatment effect is underestimated. Formally, we estimate an equation like:

$$y_{jmt} = \alpha_j + \alpha_{mt} + \sum_{k=t-4backward}^{t+6forward} \theta_k \mathbb{1}\{Conglomerate\ merger\} + \beta_1 y_{jmt0} T_t + u_{jmt} \qquad (2)$$

For this exercise, we excluded the observations in which acquisitions led to horizontal concentration for two reasons. First, the main goal of this paper is to investigate conglomerate mergers effects. Second, we do not have enough observations for the mergers that led to horizontal concentration for doing this exercise with annual pre and post periods in relation to the treatment period.

Tables 6 and 7 present the results for tuition and freshmen effects for a number of specifications. As for the average impact, in the first column we show the DID estimation with HEI and year fixed effects, in specification (2) we add municipality fixed effects, in specification (3) we use HEI and year by municipality fixed effects and in (4) we perform the DID estimation with matching and HEI and year by municipality fixed effects. Figures 1 and 2 present the point estimates for each outcome/period relative to the acquisition date and its 95% confidence interval for specification (3).

As expected, there are no anticipatory effects. The pattern of coefficients is comparable in each specification, providing robust evidence that acquisition led to the growth of price and quantity and that we were able to mitigate the selection on observables problem. The tuition fees and the number of freshmen students follow a parallel trend to other institutions in the

municipality prior to the merger, since all point estimates for the leads do treatment are inside the 95% confidence interval (see Figures 1 and 2). After the acquisition, prices and quantity immediately increase by a statistically significant amount. Prices grow up to four years after the acquisition and seem stabilized, but this growth is not sustainable after 6 years. Quantity grows in a logarithmic trend and seems stabilized after six years of the acquisition. These results also show that the exposure time of the HEI to the new academic management is relevant to measure the effects of the acquisition.

Table 6: Dynamic effects of conglomerate mergers on tuition fees

	(1)	(2)	(3)	(4)
t-4 backward	0.018	0.012	0.009	-0.010
	(0.053)	(0.053)	(0.058)	(0.051)
t-3	-0.038	-0.032	-0.033	-0.029
	(0.033)	(0.023)	(0.044)	(0.048)
t-2	-0.014	-0.003	-0.016	-0.006
	(0.024)	(0.019)	(0.039)	(0.034)
t-1	-0.002	-0.003	-0.047	-0.060***
	(0.022)	(0.022)	(0.033)	(0.023)
t+1	0.015	0.018	0.021	0.003
	(0.024)	(0.024)	(0.035)	(0.030)
t+2	0.016	0.012	0.055	0.042
	(0.032)	(0.033)	(0.049)	(0.043)
t+3	0.120***	0.119***	0.124**	0.101*
	(0.035)	(0.036)	(0.054)	(0.052)
t+4	0.165***	0.164***	0.212***	0.236***
	(0.039)	(0.039)	(0.054)	(0.062)
t+5	0.185***	0.185***	0.213**	0.235***
	(0.047)	(0.049)	(0.088)	(0.073)
t+6 forward	0.104	0.105	0.151	0.122
	(0.076)	(0.079)	(0.106)	(0.130)
Obs	9,420	9,413	6,615	6,615
Groups	1,258	1,258	978	978
HEI FE	yes	yes	yes	yes
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Dynamic effects of conglomerate mergers on freshmen undergraduate students

	(1)	(2)	(3)	(4)
t-4 backward	0.044	0.047	0.067	0.008
	(0.116)	(0.118)	(0.150)	(0.148)
t-3	0.139	0.209	0.174	0.140
	(0.149)	(0.132)	(0.147)	(0.140)
t-2	-0.030	0.001	0.035	0.058
	(0.147)	(0.134)	(0.146)	(0.137)
t-1	-0.032	-0.036	-0.025	-0.073
	(0.081)	(0.082)	(0.081)	(0.090)
t+1	0.395***	0.402***	0.422***	0.514***
	(0.107)	(0.109)	(0.141)	(0.173)
t+2	0.657***	0.654***	0.709***	0.813***
	(0.104)	(0.105)	(0.118)	(0.114)
t+3	0.679***	0.699***	0.817***	0.913***
	(0.129)	(0.132)	(0.138)	(0.156)
t+4	0.812***	0.836***	0.913***	0.928***
	(0.141)	(0.145)	(0.148)	(0.175)
t+5	0.742***	0.766***	0.964***	1.047***
	(0.120)	(0.122)	(0.155)	(0.192)
t+6 forward	0.775***	0.813***	0.972***	1.114***
	(0.214)	(0.219)	(0.263)	(0.259)
Obs	13,077	13,060	9,863	9,791
Groups	1,497	1,497	1,213	1,213
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

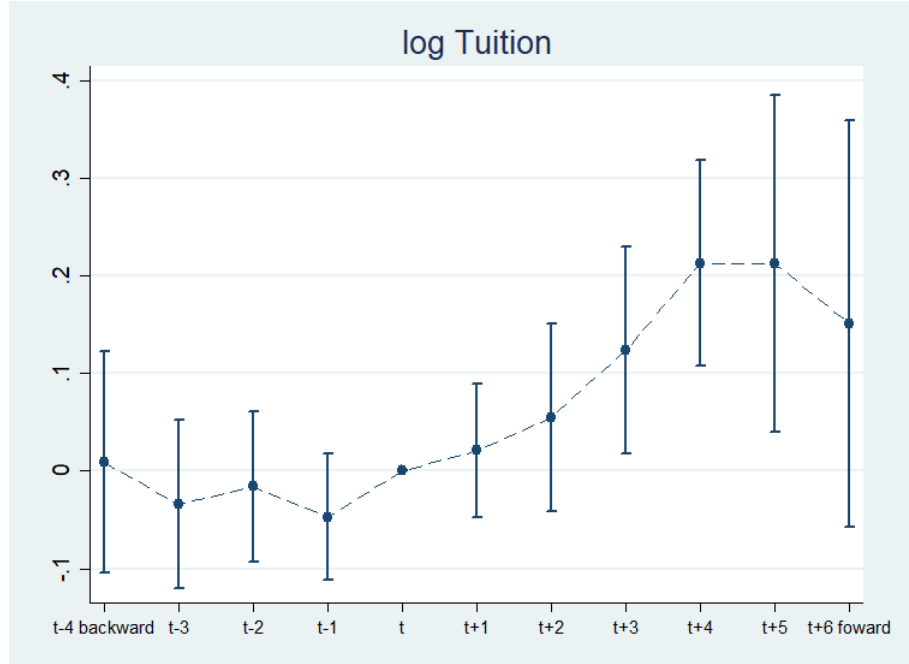Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: Dynamic effects on tuition fees

log Tuition

*Leads and lags point estimates of DID estimation with HEI fixes effects and year by municipality fixed effects. 95% confidence interval constructed from HEI clustered standard errors. The point estimates are relative to the official date of acquisition t.

Figure 2: Dynamic effects on freshmen undergraduate students
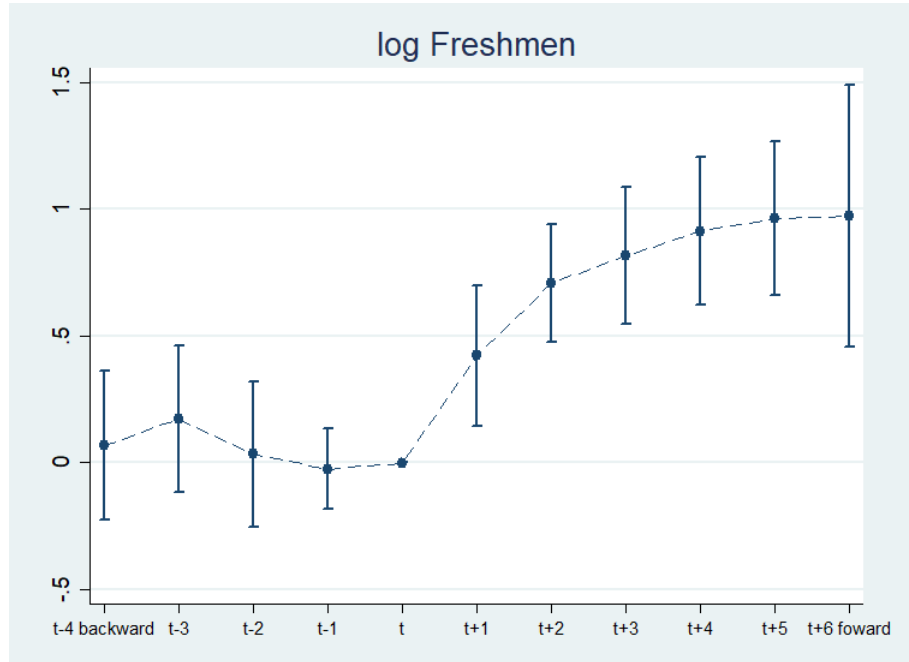

log Freshmen

*Leads and lags point estimates of DID estimation with HEI fixes effects and year by municipality fixed effects. 95% confidence interval constructed from HEI clustered standard errors. The point estimates are relative to the official date of acquisition t.

4.2.2. Potential competitors reactions

A potential issue that could invalidate our identification strategy is that rival institutions may optimally react to the price and quantity changes made by the acquired HEIs after the acquisition. If this happens, the non-acquired HEIs in the same municipality as the acquired ones would not be a suitable control group for the acquired ones, as we are considering the municipality as the geographic relevant market for in-class undergraduate courses. The direction of the impact is not clear, since rivals prices can be strategic substitutes or complements, and even exhibiting diverse reactions from rival to rival.

To investigate this issue, for all HEIs located in the same municipality as the acquired ones, we assign treatment from the acquisition year, excluding from the dataset the acquired HEIs. We estimated an equation like:

$$y_{jmt} = \alpha_j + \alpha_m + \alpha_t + \theta \mathbb{1}\{Treated_{jt}\} + \theta \mathbb{1}\{Overlap_{jt}\} + \beta_1 y_{jmt0} T_t + u_{jmt} \qquad (3)$$

where again y_{jmt} is the outcome variable of the HEI j, in the municipality m, period t. $\mathbb{1}\{Treated_{jmt}\}$ is an indicator for whether HEI j is a competitor for an acquired HEI in the municipality m in the period t. $\mathbb{1}\{Overlap_{jmt}\}$ is an indicator for whether the acquisition increased the concentration in the municipality m. y_{jmt0} is the outcome variable in the first period in which it can be observable in the dataset. We add HEI, year and municipality fixed effects. As all institutions from a municipality are considered rivals, and therefore treated in this exercise, we have not estimated an equation including year by municipality fixed effects, which would hide the effect we are trying to investigate.

Results for tuition fees and freshmen are presented in tables 8 and 9. In the first column we show the DID estimation with HEI and year fixed effects, in specification (2) we add municipality fixed effects, in specification (3) we perform the DID estimation with matching and HEI, year and municipality fixed effects. For tuition fees, none of the specifications show significant results for rivals. For freshmen, specification (1) bring a positive and significant impact, which is offset by including municipality fixed effects in the later specifications. These results suggest that the other HEIs located in the same municipality as the acquired ones can be considered as a valid contrafactual group for acquired institutions.

Table 8: Difference-in-differences estimation for competitors, tuition fees

	(1)	(2)	(3)
Treated	0.034	-0.005	-0.028
	(0.027)	(0.017)	(0.024)
Overlap	-0.001	-0.002	0.024
	(0.043)	(0.022)	(0.026)
Obs	9,093	9,087	9,078
Groups	1,210	1,210	1,209
HEI FE	yes	yes	yes
Year FE	yes	yes	yes
Municipality FE	no	yes	yes
Matching	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Difference-in-differences estimation for competitors, freshmen

	(1)	(2)	(3)
Treated	0.293**	0.009	0.063
	(0.114)	(0.048)	(0.064)
Overlap	0.036	0.040	-0.087
	(0.182)	(0.069)	(0.086)
Obs	12,582	12,565	12,556
Groups	1,443	1,443	1,442
HEI FE	yes	yes	yes
Year FE	yes	yes	yes
Municipality FE	no	yes	yes
Matching	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.2.3. Does the educational group matter?

In order to check for heterogeneous impacts regarding educational groups, we estimated an equation using separating indicator variables for the acquiring groups in the post-treatment periods. Given that some effects are dependent on the horizontal concentration and as our main interest resides in measuring the conglomerate effect, the acquired HEIs in the municipalities where

the acquisition led to horizontal concentration were excluded from these estimations. Formally, to measure group-specific treatment effects we estimate:

$$y_{jmt} = \alpha_j + \alpha_{mt} + \sum_g \theta_g \mathbb{1}\{j \text{ belongs to group } g \text{ since } t\} + \beta_1 y_{jmt0} T_t + u_{jmt} \tag{4}$$

where y_{jmt} is the outcome variable (price or quantity) of the HEI j, in the municipality m, period t. $\mathbb{1}\{j \text{ belongs to group } g \text{ since } t\}$ is an indicator whether the HEI j was acquired and belongs to the group g in t, where g can be *Anhanguera, Kroton, Estácio* or *Laureate*. y_{jmt0} is the outcome variable in the first period in which it can be observable in the dataset. α_j and α_{mt} are HEI fixed effects and year by municipality fixed effects, respectively. As before, we test some other simpler specifications and a specification in which we match treated and non-treated HEIs based on observable characteristics prior treatment. Our results are shown in Tables 10 and 11.

Table 10: Difference-in-differences estimation by educational group, tuition fee impacts

	(1)	(2)	(3)	(4)
Anhanguera	0.176***	0.163***	0.121**	0.118
	(0.036)	(0.032)	(0.053)	(0.073)
Kroton	0.047*	0.051**	0.110**	0.101*
	(0.027)	(0.026)	(0.051)	(0.057)
Estácio	-0.098**	-0.096**	-0.007	-0.009
	(0.045)	(0.046)	(0.037)	(0.045)
Laureate	0.113***	0.107***	0.127	0.100*
	(0.037)	(0.036)	(0.085)	(0.053)
Obs	9,420	9,413	6,615	6,615
Groups	1,258	1,258	978	978
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Results are indisputable in showing an expressive increase in freshmen for all educational groups. In this case, the heterogeneity is related to the magnitude of the effects. In the worst scenario, freshmen increase by 33% for Kroton according to specification (3). Laureate is the more successful group in attracting new students, reaching a growth of 82% in the number of freshmen. Actually these numbers can be even more impressive, as we are estimating an average effect over time.

Regarding tuition fees, results show more diverse effects. All specifications, except specification (4) for *Anhanguera*, indicate that Kroton and Anhanguera increase prices. For specification (3), the growth reaches 11% and 12% for Kroton and Anhanguera respectively. Results bring some

Table 11: Difference-in-differences estimation by educational group, freshmen impacts

	(1)	(2)	(3)	(4)
Anhanguera	0.383**	0.416**	0.504**	0.630***
	(0.194)	(0.203)	(0.230)	(0.196)
Kroton	0.503***	0.512***	0.328**	0.276*
	(0.083)	(0.084)	(0.138)	(0.155)
Estácio	0.380**	0.407**	0.605***	0.583***
	(0.155)	(0.160)	(0.116)	(0.117)
Laureate	1.029***	0.813***	0.818***	0.963***
	(0.251)	(0.200)	(0.212)	(0.200)
Obs	13,077	13,060	9,863	9,791
Groups	1,497	1,497	1,213	1,213
HEI FE	yes	yes	yes	yes
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

evidence that Laureate increases tuition fees by an amount between 8-11%, although specification (3) was not found significant. There is also some evidence, although not robust, that Estácio decreases tuition fees, as only specifications (1) and (2) show this effect.

Excluding the results for Estácio, the effects for conglomerate mergers are consistent with an upward shift for the demand curve when an educational group takes over a local HEI, once there is an increase in both freshmen and tuition fees. This effect is remarkable for Anhanguera, which raised prices by a magnitude similar to Kroton, but attracted more new students in percentage. Repeatedly in the last years, Anhanguera is the most valuable educational brand in the country according to Millward Brown, which could help us to explain this result by brand awareness. However, Estácio is the second educational brand in the same ranking and did not increase tuition fees when compared to the others HEIs. Actually it can be a positioning strategic decision, once Estácio did not raise prices but attracted more new students than Anhanguera in percentage. Kroton and Laureate are not ranked because they are multi brand groups with a different strategy: they take advantage of the local reputation of the acquired brands, while Anhanguera and Estácio immediately change the brand of the acquired HEI after the acquisition for their single brands.

4.3. Quality effects

In this section we explore what happened with some quality indicators of the HEIs and of the the undergraduate courses after a HEI is acquired by an educational group. Changes in quality may

be necessary to standardize the products offered by a firm across its units and make them benefit from scope and scale economies. Furthermore, price and quantity increases can be explained, even partially, by a better actual or perceived quality of the undergraduate courses, which could help us to interpret the results found in the last subsection.

4.3.1. HEI quality index

We start this investigation by the IGC (General Course Index), the main HEI quality index. The IGC ranges from 0 to 5 points and takes into account the students' performance in the national exam Enade, faculty, pedagogical organization, infrastructure and quality of the graduate courses. We estimated an equation like Equation 4 and used the log of the index for the estimation. Table 12 presents the results. At least for Anhanguera and Kroton, the increase in the main HEI quality index can help to explain the increase in prices and quantities. According to specification (3), Anhanguera's IGC index grew 11% while Kroton's IGC quality index grew 15%. None of the specifications indicated a change for Estácio and Laureate when compared to the other HEIs.

Table 12: Difference-in-differences estimation by educational group, IGC quality index

	(1)	(2)	(3)	(4)
Anhanguera	0.021	0.021	0.109***	0.100**
	(0.052)	(0.053)	(0.037)	(0.043)
Kroton	0.139***	0.139***	0.149***	0.120***
	(0.020)	(0.021)	(0.038)	(0.046)
Estácio	-0.039	-0.039	-0.011	-0.003
	(0.031)	(0.032)	(0.040)	(0.034)
Laureate	-0.019	-0.019	0.022	0.007
	(0.037)	(0.038)	(0.056)	(0.042)
Obs	11,684	11,683	8,939	8,930
Groups	1,525	1,525	1,208	1,207
HEI FE	yes	yes	yes	yes
Year FE	yes	yes	no	no
Municipality FE	no	yes	no	no
Year x Municipality FE	no	no	yes	yes
Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3.2. Undergraduate courses quality indicators

Although a general HEI quality index can bring some evidence for quality changes, a further investigation using quality indicators at the level of the courses can be more explanatory, specially

to evaluate the effects of the acquisition on students. In this subsection we evaluate the acquisition impact on faculty profile and on students performance. For teachers, the outcome variables are the proportion of teachers with a PhD degree and the proportion of teachers in full-time contract at the course. For the students performance, we look at the graduating students performance at the General Knowledge test and at the Subject test in the national exam Enade, both ranging from 0 to 100 points.

As mentioned before, undergraduate courses are evaluated by the Ministry of Education each three years and we have information on tuition fees for about 60% of all the in-class undergraduate courses. To be consistent with the previous estimates on price and quantity, we present here the analysis including only the information on faculty profile and students performance for courses we have also the tuition fee information, i.e. for courses we have evaluated the tuition fee impact[9].

For each outcome at the course level, we estimate an equation like:

$$y_{jmct} = \alpha_j + \alpha_{ct} + \sum_g \theta_g \mathbb{1}\{j \ belongs \ to \ group \ g \ since \ t\} + u_{jmct} \tag{5}$$

where y_{jmct} is the outcome variable of the HEI j, in the municipality m, course c, period t. $\mathbb{1}\{j \ belongs \ to \ group \ g \ since \ t\}$ is an indicator whether the HEI j was acquired and belongs to the group g in t. α_j and α_{ct} are HEI fixed effects and year by course fixed effects, respectively. By using year by course fixed effects we control for differences in the difficulty level of the students' tests each year, for example. As before, we test some other simpler specifications and a specification in which we match treated and non-treated HEIs based on observable characteristics prior treatment. Results for faculty profile are shown in Table 13 and for students' performance in Table 14.

Anhanguera, Kroton and Laureate raised the proportion of teachers with a PhD degree when compared to the others HEIs by 25 p.p., 8 p.p. and 4 p.p. respectively when compared to the other HEIs, according to specification (3). Kroton also raised the proportion of full-time teachers by 30 p.p., while Laureate deteriorated it by 28 p.p.. Estácio has not changed its faculty profile when compared to the other HEIs. The hiring of teachers with PhD by Anhanguera, Kroton and Laureate can help us to explain the increase in tuition fees and number of freshmen. As well as costs may have increased, these hirings may have helped to increase the perceived quality by freshmen after the acquisition. On the other hand, HEIs acquired by Estácio experienced changes just in the number of freshmen, which may be explained by brand awareness.

Unfortunately, hiring teachers with a PhD degree did not lead to a better performance of the

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[9]The results for the complete set of undergraduate courses are not qualitatively different from the ones presented here and can be provided upon request.

graduating students, at least for Anhanguera and Laureate. Anhanguera and Laureate students' performance has deteriorated both for general knowledge and subject tests when compared to the others HEIs. Kroton's students did a better job in the general knowledge test when compared to the others HEIs. However, none of the results on students' performance can be assigned to changes in the faculty profile, once the students profile could have changed after the acquisition.

Table 13: Difference-in-differences estimation by educational group, Faculty Profile

		(1)	(2)	(3)	(4)
% of teachers with PhD	*Anhanguera*	0.248***	0.252***	0.254***	0.225***
		(0.063)	(0.061)	(0.061)	(0.060)
	Kroton	0.083**	0.085**	0.082**	0.055*
		(0.035)	(0.034)	(0.035)	(0.033)
	Estácio	0.021	0.013	0.012	0.008
		(0.021)	(0.019)	(0.019)	(0.022)
	Laureate	0.036***	0.035***	0.042***	0.007
		(0.006)	(0.006)	(0.007)	(0.015)
% of full-time teachers	*Anhanguera*	0.013	0.010	0.009	-0.012
		(0.101)	(0.101)	(0.101)	(0.098)
	Kroton	0.309***	0.308***	0.301***	0.290***
		(0.077)	(0.077)	(0.076)	(0.078)
	Estácio	-0.042	-0.050	-0.055	-0.054
		(0.067)	(0.068)	(0.074)	(0.087)
	Laureate	-0.277***	-0.279***	-0.279***	-0.299***
		(0.010)	(0.011)	(0.012)	(0.018)
	Obs	19,291	19,286	19,284	19,272
	Groups	1,528	1,528	1,247	1,246
	HEI FE	yes	yes	yes	yes
	Year FE	yes	yes	no	no
	Course	no	yes	no	no
	Year x Course FE	no	no	yes	yes
	Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Difference-in-differences estimation by educational group, Students' Performance

		(1)	(2)	(3)	(4)
GK Test	*Anhanguera*	-0.061*	-0.069**	-0.067**	-0.078**
		(0.035)	(0.033)	(0.030)	(0.031)
	Kroton	0.055**	0.060**	0.059**	0.041
		(0.027)	(0.027)	(0.028)	(0.028)
	Estácio	0.080**	0.069**	0.059**	0.048*
		(0.036)	(0.030)	(0.028)	(0.026)
	Laureate	-0.093***	-0.099***	-0.090***	-0.110***
		(0.013)	(0.013)	(0.016)	(0.019)
	Obs	16,950	16,942	16,939	16,929
	Groups	1,525	1,525	1,208	1,207
Subject Test	*Anhanguera*	-0.111**	-0.098***	-0.109***	-0.109***
		(0.045)	(0.031)	(0.020)	(0.025)
	Kroton	0.024	0.016	0.023	0.012
		(0.032)	(0.023)	(0.022)	(0.026)
	Estácio	-0.018	-0.010	-0.009	-0.012
		(0.070)	(0.063)	(0.047)	(0.055)
	Laureate	-0.179***	-0.102***	-0.052***	-0.060***
		(0.009)	(0.015)	(0.007)	(0.017)
	Obs	16,952	16,944	16,941	16,931
	Groups	1,528	1,528	1,247	1,246
	HEI FE	yes	yes	yes	yes
	Year FE	yes	yes	yes	yes
	Course FE	no	yes	no	no
	Year x Course FE	no	no	yes	yes
	Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3.3. Does the student profile change?

Despite the improving in the quality of teaching staff through a process of hiring teachers with a PhD degree, Anhanguera and Laureate students' performance did not present any improvement at the national exam. To check if the students profile has changed after the acquisition, we look at three variables available at the socioeconomic questionnaire that students are required to answer when applying for the exam: the age of the student, in years; the gender, which equals 1 for male student and zero for female student; and the gap between the date of the higher education entry

and the high school conclusion, measured in years. Unfortunately, the questionnaire does not ask for race or income of the student, but these variables can bring us some evidence if the average student profile has changed. As with the other variables at the course level, we present results for the courses that we also have the tuition fee information. We estimated an equation like Equation (5), bringing results by educational group in Table 15.

Results bring evidence of changes in the students' profile. When compared to the others HEIs, Anhanguera and Estácio raised the proportion of male students after the acquisition, while Laureate decreased. There is also some evidence that Anhanguera, Estácio and Laureate increase students with a higher gap between the high school conclusion and the higher education entry. These results are not peremptory, but present some evidence that the acquisition possibly changes the students' profile, which make their performances in the acquired HEIs not comparable over time. Thereby, we cannot claim that the educational groups provide poorer quality courses or that teachers with PhD are not able to improve students' performance.

Table 15: Difference-in-differences estimation by educational group, students' characteristics

		(1)	(2)	(3)	(4)
Age	*Anhanguera*	-0.246	-0.404	-0.387	-0.434
		(0.312)	(0.287)	(0.286)	(0.328)
	Kroton	-0.727	-0.781	-0.819	-0.779
		(0.516)	(0.528)	(0.509)	(0.493)
	Estácio	-0.073	-0.094	-0.094	-0.287
		(0.389)	(0.299)	(0.252)	(0.311)
	Laureate	0.289	0.214	0.371*	0.371
		(0.420)	(0.212)	(0.201)	(0.237)
Gender	*Anhanguera*	0.049	0.050***	0.050***	0.043***
		(0.037)	(0.011)	(0.009)	(0.011)
	Kroton	-0.044	-0.042	-0.044	-0.043
		(0.045)	(0.037)	(0.037)	(0.033)
	Estácio	0.013	0.064***	0.057***	0.058***
		(0.056)	(0.010)	(0.011)	(0.013)
	Laureate	0.006	-0.031***	-0.023**	-0.021**
		(0.020)	(0.008)	(0.009)	(0.009)
Gap HS-HE	*Anhanguera*	0.866*	0.689	0.826*	0.874
		(0.472)	(0.470)	(0.473)	(0.541)
	Kroton	0.413	0.424	0.368	0.409
		(0.882)	(0.853)	(0.855)	(0.919)
	Estácio	0.296	0.306	0.457*	0.283
		(0.214)	(0.236)	(0.246)	(0.233)
	Laureate	1.456***	1.372***	3.349	1.678**
		(0.378)	(0.295)	(2.348)	(0.654)
	Obs	16,963	16,955	16,952	16,893
	Groups	1,528	1,528	1,247	1,246
	HEI FE	yes	yes	yes	yes
	Year FE	yes	yes	no	no
	Course	no	yes	no	no
	Year x Course FE	no	no	yes	yes
	Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.4. Government incentive programs

As explained in the industry background section, an important part of the growth of the private higher education is due to two large incentive programs promoted by the Federal Government, Prouni, which provides partial and full scholarships for undergraduate students, and Fies, which provides educational credit on attractive conditions.

In this section, our aim is to investigate if the educational groups are able to benefit from these programs more than the other HEIs. There is some anecdotal evidence that these groups boost the number of students benefited by these programs by taking care of all the bureaucratic procedures for the students to apply for the program. If this is true, it can help us to explain the increase in the number of freshmen students as well as the increase in tuition fees, since having a scholarship or a student loan can reduce the price elasticity of the demand.

For this exercise, Prouni and Fies variables are defined as the number of enrolled undergraduate students at the HEI in a municipality benefited by the respective program. Results are presented in Table 16 and the specifications follow the ones explained above. Kroton heavily increased the number of enrolled students with the governmental student loan Fies when compared to the other HEIs. Anhanguera also did it, but in a lesser extent. Kroton also raised the number of enrolled students benefited by Prouni by a slight but significant amount, while Estácio decreased it.

Prouni does not seem very attractive to the educational groups. Probably this is due to the nature of the programs. While the government pays the students tuition funded by Fies to the HEIs by means of government bonds, the HEIs just get limited federal tax exemptions from offering a limited number of vacancies to Prouni. The intense exploration of the government funding Fies can be an easier way to reduce the default levels for the HEIs, once the risk is transferred from the HEI to the government. This effect can be an example of the expertise and the collective goods that can be provided by the educational groups to the HEIs.

Table 16: Difference-in-differences estimation by educational group, Government Incentive Programs

		(1)	(2)	(3)	(4)
Fies	*Anhanguera*	42.869**	42.914**	39.793	70.949***
		(16.936)	(17.382)	(24.258)	(20.104)
	Kroton	110.086***	110.111***	121.593***	82.809***
		(30.278)	(31.086)	(37.768)	(25.908)
	Estácio	66.687	66.754	81.743	95.332
		(58.238)	(59.762)	(64.051)	(77.744)
	Laureate	-8.457	-12.988	-1.296	2.897
		(30.417)	(32.031)	(23.352)	(10.298)
Prouni	*Anhanguera*	-11.640	-11.396	-19.234	-2.136
		(12.205)	(12.520)	(14.805)	(10.758)
	Kroton	8.741*	8.896*	19.151***	18.408**
		(5.057)	(5.212)	(7.311)	(8.498)
	Estácio	-18.555	-18.314	-28.343*	-25.338
		(11.622)	(11.931)	(16.088)	(28.022)
	Laureate	37.741	38.737	43.029	66.060
		(46.128)	(51.653)	(54.147)	(59.533)
	Obs	13,451	13,425	10,139	10,067
	Groups	1,528	1,528	1,247	1,246
	HEI FE	yes	yes	yes	yes
	Year FE	yes	yes	no	no
	Municipality FE	no	yes	no	no
	Year x Municipality FE	no	no	yes	yes
	Matching	no	no	no	yes

Clustered standard errors at the HEI level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5. Conclusion

Mergers and acquisitions may change competition even when they do not affect market structure. Conglomerate mergers by definition do not imply horizontal concentration or vertical integration, but still they may affect competition as they may result in scale or scope economies for the merging companies, inhibit potential competition, and increase the likelihood of anticompetitive strategies. Although there is little evidence that pure conglomerate mergers have significant effects on competition, in cases of product or market expansion mergers such effects, both positive and negative, are likely. Still there is not a consensus among competition authorities on how to deal with conglomerate mergers. A pertinent question is whether conglomerate mergers should be

scrutinized in a pre-merger review or should their anticompetitive effects be subject to the ex-post control of conducts (Hovenkamp, 2005).

This paper provides some empirical evidence to inform this debate. With a database containing 120 acquisitions of Higher Education Institutions by educational groups in the Brazilian market, we estimated its effects on price, quantity and quality for horizontal and conglomerate mergers (market extension mergers). We provide robust evidence that multiunit educational groups benefit from scale and scope economies both in horizontal and conglomerate mergers, which translates to better quality indicators and evidence of quality perceived by students. Moreover price and quantity effects reveal that conglomerate mergers tend to pass on part of the efficiency gains to consumers (by means of higher quantity), differently from horizontal mergers that in average have a positive effect on prices but not on enrollment level. We also explored the dynamic effects, which showed that the magnitude of the effects has not been fully captured, since they appear to be still in progress over time.

Finally we found heterogeneous effects according to the educational group, which seems to be related to the brand name positioning, an issue to be further explored in future studies. As merger control is primarily concerned about the effects of single cases rather than the average effect, this result still gives some leeway for competition authorities to care about conglomerate mergers.

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Appendix

Table A.1: Mean differences tests between the treatment and control groups

Variable	Unmatched (U) Matched (M)	Mean		t-test	
		Treated	**Control**	**t**	**p>t**
Enrollment	U	3,288	1,939	2.790	0.005
	M	3,288	3,595	-0.300	0.768
Freshmen	U	139	102	2.230	0.026
	M	139	166	-0.840	0.401
Vacancies	U	2,186	1,128	2.850	0.004
	M	2,186	2,842	-0.610	0.545
Share of the biggest municipality	U	0.975	0.984	-0.820	0.411
for HEI	M	0.975	0.978	-0.180	0.856
HEI share at the biggest	U	0.165	0.274	-2.900	0.004
municipality for HEI	M	0.165	0.177	-0.320	0.747
Counties of HEI	U	1.224	1.281	-0.120	0.902
	M	1.224	1.327	-0.320	0.749
Courses offered	U	10.306	7.373	2.870	0.004
	M	10.306	10.274	0.020	0.984
IGC (HEI quality index – 0-5 points)	U	2.078	2.130	-0.840	0.401
	M	2.078	2.080	-0.020	0.986
Public HEI	U	0.871	0.711	3.200	0.001
	M	0.871	0.859	0.220	0.823
Population (10^3)	U	1,764	1,442	1.010	0.312
	M	1,764	1,827	-0.130	0.895
Pop 18-24/Population	U	0.136	0.132	3.040	0.002
	M	0.136	0.136	0.190	0.849
Wage Bill (annual per capita) (10^3)	U	5,995	4,911	2.620	0.009
	M	5,995	6,015	-0.040	0.971
Formal Jobs/Population	U	0.316	0.267	3.630	0.000
	M	0.316	0.309	0.370	0.713
% Formal Jobs w/ incomplete H.E.	U	0.043	0.040	1.650	0.100
	M	0.043	0.043	0.020	0.984
% Formal Jobs w/ complete H.S.	U	0.404	0.378	3.070	0.002
	M	0.404	0.397	0.580	0.560
% Formal Jobs in Com/Service	U	0.761	0.717	2.740	0.006
	M	0.761	0.755	0.270	0.786
% Formal Jobs up to 2 M.W.	U	0.468	0.517	-2.960	0.003
	M	0.468	0.466	0.070	0.942