The For-Profit Graduation Rate Problem

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Abstract

The private for-profit college sector has experienced incredible growth and profitability during the last decade. While enrollment and federal student aid has increased substantially, graduation rates have continuously decreased. With graduation rates at only 32% in 2012, millions of students are trapped in high debt with no degree. In this paper, I use fixed effects estimation to investigate the leading institutional factors causing students to leave for-profit schools without completing their program. The data used in this study is accessed from the U.S. Department of Education's *National Center for Education Statistics* for the 2008 to 2013 school years. Non-profit private and public institutional data is also explored to see if there are similar trends across all higher education sectors concerning graduation rates.

I. Introduction

During the 2000's, for-profit colleges soared in size and growth. Millions of non-traditional students were lured into for-profit colleges with the dream of obtaining a college education at their own convenience. For-profit colleges attract a disproportionately high amount of low-income Americans compared to public non-profit colleges, despite having higher tuition rates (Demming, Goldin, Katz 2012). For-profit colleges spend millions on television, public transportation, online, and radio advertisements. These advertisements may promise flexible scheduling, convenient locations, online options, fast-earned degrees, and relevant job training; nonetheless, what is not being advertised is the steep price tag and value of the degree. The most concerning problem with for-profit colleges is the abysmal graduation rate. In 2012, only 32% of those who start at for-profit colleges graduate in six years, if at all (IPEDS Data Center). This rate is extremely concerning because students who attend college and fail to graduate, accumulate debt without great prospects of high earnings. The default rate on loans for students at for-profit colleges is the worst of any college sector and their students are more indebted than students at non-profit institutions.

It has been highly criticized that for-profit institutions use strategic recruiting practices to pull in unqualified students for revenue boosting intentions. The for-profit sector's business model is highly driven by enrollment. With tuition and fees as the largest source of revenue, marketing practices are essential to the existence of the sector. The majority of students are encouraged to obtain federal student aid to fund the high tuition and fee prices. The United States federal government has taken action over the revenue issue and adjusted eligibility

requirements for federal aid, such as the Pell Grant. These new requirements have hurt for-profit schools, but extensive oversight is still needed with extremely low completion rates and high default rates.

It is important to note that there are successful for-profit schools that do get overshadowed by the failure of the sector as a whole. Overall, obtaining a college degree is highly beneficial on worker's earnings and career opportunities in the Unites States. In 2014 the New York Times published an analysis of data from the U.S. Department of Labor exposing that college graduates make 98% more an hour than those without a college degree (Leonhardt, David). Not all students are well suited for the traditional four-year university. The sector as a whole is designed to help students attain post-high school degrees that serve as more of career preparation as opposed to educational advancement. For-profit colleges that offer vocational training programs in areas such as cosmetology, culinary arts, criminal justice, and medical and clinical assistant programs are necessary for the safety and well being of American citizens. These programs are mostly conducted through associate degrees and certificates.

Due to immense mistrust and concerning findings surrounding for-profit schools, new regulations set by the Obama administrations will evaluate each program by the ratio of student debt to average earnings in order to determine if the federal government will award students enrolled in the program with aid (Federal Register 2014). A program that is not deemed as high performing will most likely get shut down due to the reliance on federal aid. The new education regulations have been controversial; nevertheless it may not be sustainable for

the federal government to continue to fund students in programs with low preforming standards.

It is imperative that the for-profit school sector as a whole work to improve graduation rates due to the rising importance of a college degree. A well-known study at Georgetown University, "The Projections of Jobs and Education Requirements Through 2020", forecasts that 57% of jobs will require at least an associate's degree by 2020 (Carnevale, A., Smith, N., Strohl, J. 2013). The current system in place is failing students and as it stand the United States will not be prepared for this change in workforce dynamic by 2020.

In this paper, I focus on the graduation rates of for-profit schools to investigate the major institutional factors that are affecting graduation rates. Variables considered are enrollment numbers, average federal aid amount awarded, total revenue and investment, student-to-faculty ratio, tuition price, and whether it is a distance-learning program. I also look at non-profit private and public schools institutional data to compare findings. I intend to use my results to determine where a student can find the most success to graduate in a for-profit institution if that is their choice of schooling.

II. Data

For this study, I am using official university data from the U.S. Department of Education's Institute of Education Sciences' *National Center for Education Statistics*. The time period of the observed data is from the school year 2008-2009 to 2012-2013. I have assembled a panel dataset to examine the affect of different institutional attributes on the graduation rate of four-year for-profit

schools and four-year non-profit public and private schools. By comparing different sectors of higher education institutions, I can determine if the factors affecting for-profit schools low graduation rates are unique to that sector. In the appendix I have included the variables descriptions for the dataset (Table 1) and the summarized statistics among the different sectors.

I consider the overall, between, and within estimators in the summarized results of the variables (Table 2). The between statistics are calculated regardless of time period and rather on the basis of the different institutions. The within statistics are calculated regardless of institution and on the basis of the time period. The results are found using Stata statistical software and includes the mean, standard deviation, minimum, maximum, and number of observations in each variable. The dependent variable, the graduation rate, for for-profit schools has the mean of 35.9%. So over the time period 2008 to 2013, for-profit schools were only graduating a little over a third of enrolled students. By comparison, non-profit public schools and private schools were graduating 44.5% and 55.3% respectively. When looking at the standard deviation for all graduation rates across the difference sectors, there is more variation in the between estimator than the within estimator indicating there is more variation in individual schools than over a time period. Other very interesting summarized findings are that the average tuition and fees for four-year for-profit schools is $15,155 per year, whereas at non-profit public and private schools it was $6,608 and $21,817, respectively. This puts for-profit schools in the middle of the tuition range; however many of these programs are not proving to be very valuable.

Figure 5 gives a portrait of graduation rates and tuition prices across all higher education sectors from 2008-2012. For-profit institutions see the most significant drop in the graduation rate while the average tuition steadily increases. Both private and public non-profit schools experience tuition increases, but the graduation rates remain mostly stable. These findings for for-profit schools tell us that students are paying more to set themselves in an environment with a decreasing chance of completing. It certainty is not the trend that the United States can afford with student loans. In figure 6, total for-profit school's enrollment is graphed along with the percentage of students receiving federal aid. The enrollment decreases after 2010, possibly due to the changes in the federal Pell Grant program, but the percentage of student receiving aid is mostly experiencing a steady increase. 75% of students in 2012 are receiving aid from the federal government to attend a for-profit institution. Federal student loans have been extremely beneficial to Americans and given many people the opportunity to attend college, when they otherwise may have not had the funding; however when students are attending a college that does not facilitate the majority of students with a good chance of completion and attaining a job afterwards, it is very difficult to justify the amount of loans they are receiving. I will now look deeper into the roots of the low graduation rates.

III. Empirical Study

Due to the multiple cases of observations included in the panel data, models have to be estimated according to how individual-specific effects and time effects deal with heterogeneity that may not be observed. These unobserved

effects are being absorbed into the parameter estimates and error term so they are not being controlled for. Common estimators for panel data include pooled OLS, between estimators, fixed effects (or within estimators), first differences, and random effects. For this study, I use the Hausman test to determine the most appropriate type of estimation to use between fixed effects and random effects. The central assumption with the random effects model is that individual affects are not correlated with the regressors, which means that the unobserved characteristics are not correlated with our institutional variables. With fixed effects, the assumptions are that each institution has their own individual characteristic that influences the explanatory variables, thus meaning the effects are correlated with the explanatory variables but not other institutions characteristics.

I run the Hausman test on the for-profit model and determine that the Chi-squared is 0.00 which is less than 0.05 so I must reject the null hypothesis that random effects is the preferred estimation and use fixed effects.

Fixed effects estimation works by adding a dummy variable for each institution in the data in order to control for unobserved heterogeneity and absorb the effects of particular entities. This will result in an estimation of the true effect of the explanatory variables on the dependent variable. To interpret the coefficients you must think about their change within individual institutions over time.

In the for-profit college model, graduation rate is the dependent variable and the independent variables are student tuition, percent of students receiving federal aid, percent of student enrolled in online programs, total revenue and

investment per student, the student to faculty ratio, and the number of students enrolled at the institution. Other variables considered are listed in the summarized statistics, but they were not used in the model due to explaining similar factors already included in the model.

Using fixed effects, I run the model in Stata. In figure 7, I show the output of this estimation. The results of this test confirm that the errors are correlated with the regressors in the fixed effects model. The coefficients of the predictor variables show that the only variables in the model that tend to increase the graduation rate are the percent of students enrolled in distance learning programs at a for-profit school and the enrollment of the school (extremely low effect). The variables that have a negative effect on the graduation rate are the revenue and investment per student, price of tuition, the percent of students that receive federal aid, and the student to faculty ratio. The most interesting finding from these results is the strong positive effect of percentage of students in online courses on graduation rates. Reasons this could be case is that online courses do a very good job of educating non-traditional, and working students because it gives students the critical element of convenience in their education and in result they tend to be less likely to drop out. This variable is very statistically significant; however we do have limited observations of this since schools have only recently been reporting distance learning statistics to the United States Department of Education. Other statistically significant estimators are expected, such as the negative effect of the percentage of students receiving federal aid. This can be interpreted as institutions with a high proportion of low income students will see lower graduation rates.

Using fixed effects, I model the non-profit private and public schools to see if there is a similar effect on graduation rates. These Stata outputs can be found in the appendix as figure 8 and 9 for private and public respectively. The results of these models differ from for-profits and even from each other quite substantially. For a non-profit private school, percent of students receiving feral aid negatively affects the graduation rate but for a non-profit public school it is positively affected. This is not a large effect but it is still interesting to note the differences. Another difference between the non-profit models is the student to faculty ratio. At a public school, a higher ratio negatively affects the graduation rate, but at a non-profit public school a higher student to faculty ratio positively affects the graduation rate. This could be due to the size of private schools differing by caliber of ranking. The other variables tuition and enrollment are very small so it is hard to say they have a large effect on graduation rates.

IV. Conclusion

The dataset that I used to run fixed effects regression on was descriptive of the institutions on a broad level; however other variables that are not available to the public would have benefiting my study. Focusing on the for-profit college sector, it can be determined that distance learning is having a positive effect on graduation rates and online programs should be expanding in the for-profit sector as long as they are meeting necessary standards of education. For a working parent who wants to further their education, online programs can be the best option that increases their chance of graduation.

With student loan amounts at unsustainable levels and the federal government making eligibility requirements harder to meet, it will be interesting to observe how the decrease in student loans will affect the graduation rate in the near future. I believe that the most important thing schools can do for their students is to provide resources to encourage them to stick with the program if possible. Obtaining a college degree will put you in a much better situation to pay off the loans and improve your quality of life from the day of graduation.

Appendix

Figure 1: Variable Descriptions:

Variable	Description
UnitID	Unique identifier given to each school
year	School Year
gradrate	Graduation rate
revenuestudent	The schools total revenue and investment per student
studenttuition	The schools tuition and fees per student
percpell	Percent of students who receive Pell Grants
avgpell	Average amount of Pell Grant awarded
totfed	Total amount of federal grants
percfed	Percent of students who receive federal aid
percdistance	Percent students who are in online programs
stfratio	Student to Faculty ratio
enroll	Number of students enrolled

Figure 2: For-Profit 4-Year Schools 2008-2013

Variable		Mean	Std. Dev.	Min	Max	Observations	
UnitID	overall	364284.5	128946	101116	482990	N =	4120
	between		129008.7	101116	482990	n =	824
	within		0	364284.5	364284.5	T-bar =	5
time	overall	2010	1.41	2008	2012	N =	4120
	between		0	2010	2010	n =	824
	within		1.41	2008	2012	T-bar =	5
gradrate	overall	35.94	20.16	0	100	N =	2370
	between		19.02	0	100	n =	559
	within		9.14	-14.56	98.34	T-bar =	4.24
revenuestudent	overall	17,036.24	10,501.32	441.97	246,026.90	N =	3153
	between		8722.57	1454.81	145902.8	n =	737
	within		5520.03	-43031.31	125415.9	T-bar =	4.28
studenttuition	overall	15,155.15	9,742.85	394.24	245,758.50	N =	3153
	between		7,670.38	712.16	113,632.20	n =	737
	within		5,569.13	-49,954.52	147,281.40	T-bar =	4.29
percpell	overall	61.25	18.53	0	100	N =	3255
	between		16.70	0	100.00	n =	758
	within		9.40	11.24	102.25	T-bar =	4.29
avgpell	overall	3,718.76	834.54	156	8453	N =	3236
	between		608.57	997.4	5,377.60	n =	755
	within		622.56	622.56	6,794.16	T-bar =	4.29
totfed	overall	1,392.34	9034.31	0	303,286	N =	3255
	between		8,119.63	0	211,390.60	n =	758
	within		2,393.75	-50998.26	93,287.74	T-bar =	4.29
percfed	overall	72.39	16.92	0	100	N =	3255
	between		14.32	0	100	n =	758
	within		10.05	12.59	117.39	T-bar =	4.29
percdistance	overall	0.9	0.63	0.01	17.36	N =	1366
	between		0.5	0.01	9.5	n =	717
	within		0.39	-6.96	117.39	T-bar =	1.91
stfratio	overall	20.19	34.18	1	1436	N =	3164
	between		19.95	3.6	338	n =	717
	within		28.74	-267.81	1,118.19	T-bar =	4.41
enroll	overall	2,148.82	12,388.48	1	307,965	N =	3380
	overall		11,470.02	17.5	292,926.20	n =	777
	between		1,787.33	-34,375.38	35,322.02	T-bar =	4.35

Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Figure 2: Non-Profit 4-Year Public Schools 2008-2013

Variable		Mean	Std. Dev.	Min	Max	Observations	
UnitID	overall	194950.4	66912.89	100654	483124	N =	3560
	between		66950.53	100654	483124	n =	712
	within		0	194950.4	194950.4	T-bar =	5
time	overall	2010	1.41	2008	2012	N =	3560
	between		0	2010	2012	n =	712
	within		1.41	2008	2012	T-bar =	5
gradrate	overall	44.54	17.81	2	100	N =	3259
	between		17.62	5.6	100	n =	664
	within		3.25	10.94	89.34	T-bar =	4.9
percpell	overall	36.99	15.08	5	99	N =	3431
	between		14.08	7.2	83.00	n =	696
	within		5.33	-5.41	67.19	T-bar =	4.9
avgpell	overall	3,913.37	537.25	1148	6303	N =	3434
	between		349.76	2001.2	5,057.80	n =	696
	within		410.87	1213.97	5,918.17	T-bar =	4.9
totfed	overall	5,470.59	5227.01	1	39,632	N =	3431
	between		5,137.71	1	34,527.40	n =	696
	within		852.01	-3844.8	15,573.80	T-bar =	4.9
percfed	overall	59.84	15.56	6	100	N =	3431
	between		14.39	9.4	97.4	n =	696
	within		5.98	5.64	100.84	T-bar =	4.9
stfratio	overall	18.05	4.41	0	39	N =	3429
	between		4.23	0	32.6	n =	692
	within		1.55	2.85	33.25	T-bar =	4.95
enroll	overall	11,354.22	11,213.71	40	73,378	N =	3509
	overall		11,183.13	42.4	70,243.60	n =	7.4
	between		749.97	5,664.22	19,595.02	T-bar =	4.98
tuition	overall	6,608.89	2,815.97	0	16,590	N =	3299
	overall		2,736.69	0	15,160.00	n =	662
	between		697.72	3,541.89	9,761.49	T-bar =	4.98

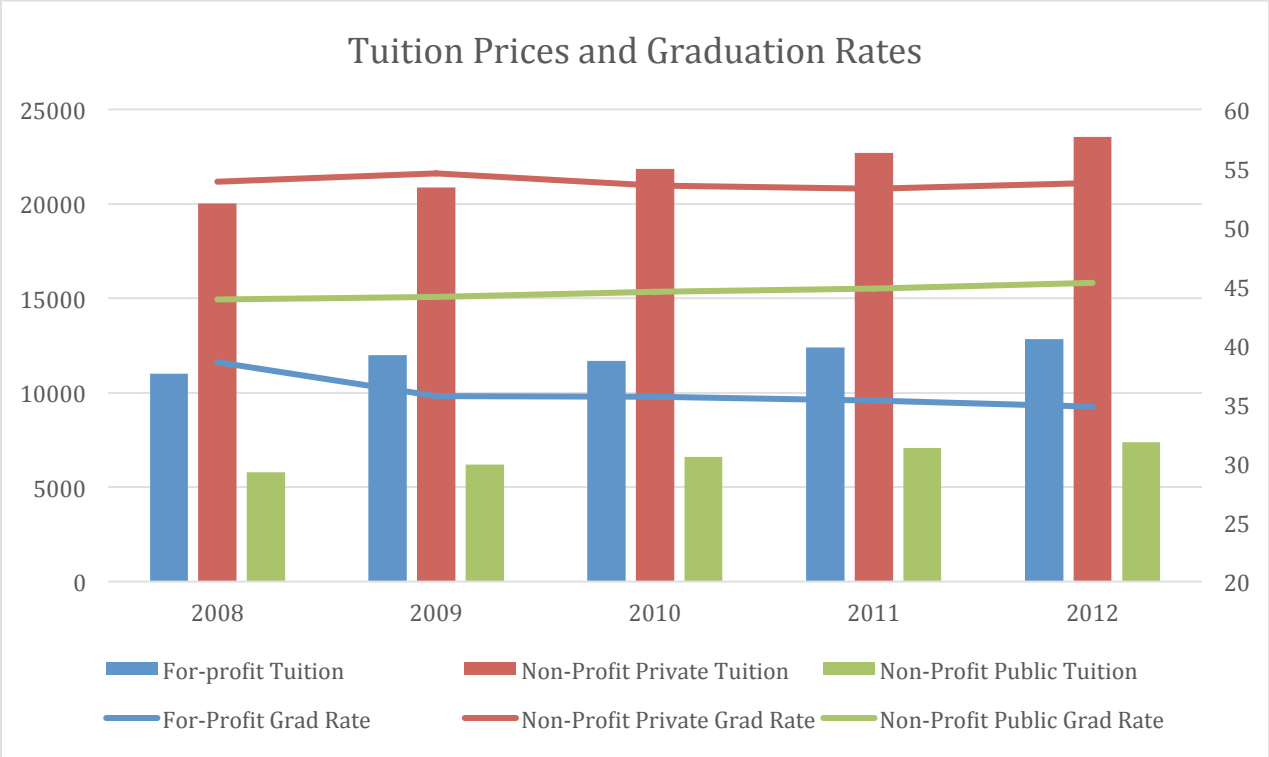
Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Figure 4: Non-Profit 4-Year Private Schools 2008-2013

Variable		Mean	Std. Dev.	Min	Max	Observations	
UnitID	overall	214155.8	95019.98	100690	482705	N =	8220
	between		95043.11	100690	482705	n =	1644
	within		0	214155.8	214155.8	T-bar =	5
time	overall	2010	1.41	2008	2012	N =	8220
	between		0	2010	2012	n =	1640
	within		1.41	2008	2012	T-bar =	5
gradrate	overall	53.8	21.6	0	100	N =	6346
	between		20.27	0	100	n =	1308
	within		8.46	-22.2	128.2	T-bar =	4.85
percpell	overall	38.85	21.1	0	100	N =	6858
	between		20.28	0	100.00	n =	1404
	within		6.85	-22.75	87.85	T-bar =	4.88
avgpell	overall	3,811.55	719.58	214	7990	N =	6768
	between		543.11	1024.8	5,668.80	n =	1387
	within		492.54	624.56	6,419.80	T-bar =	4.88
totfed	overall	1,510.25	1934.08	0	38,467	N =	6858
	between		1,900.41	0	28,260.60	n =	1404
	within		302.32	-7393.35	11,716.65	T-bar =	4.88
percfed	overall	78.92	19.44	0	100	N =	6858
	between		18.42	0	100	n =	1404
	within		8.11	13.32	131.72	T-bar =	4.88
stfratio	overall	13.56	6.6	0	152	N =	6826
	between		5.69	0	60.6	n =	1423
	within		3.6	-23.04	104.95	T-bar =	4.79
enroll	overall	2470.38	4,198.29	8	74,372	N =	7977
	overall		4,136.58	11.4	55,001.80	n =	1628
	between		520.22	-18,927.42	21,840.58	T-bar =	4.9
tuition	overall	21817.48	10,281.65	0	49,793	N =	6415
	overall		10,204.70	0	47,180.60	n =	1320
	between		1,645.58	11,087.48	38,609.08	T-bar =	4.86

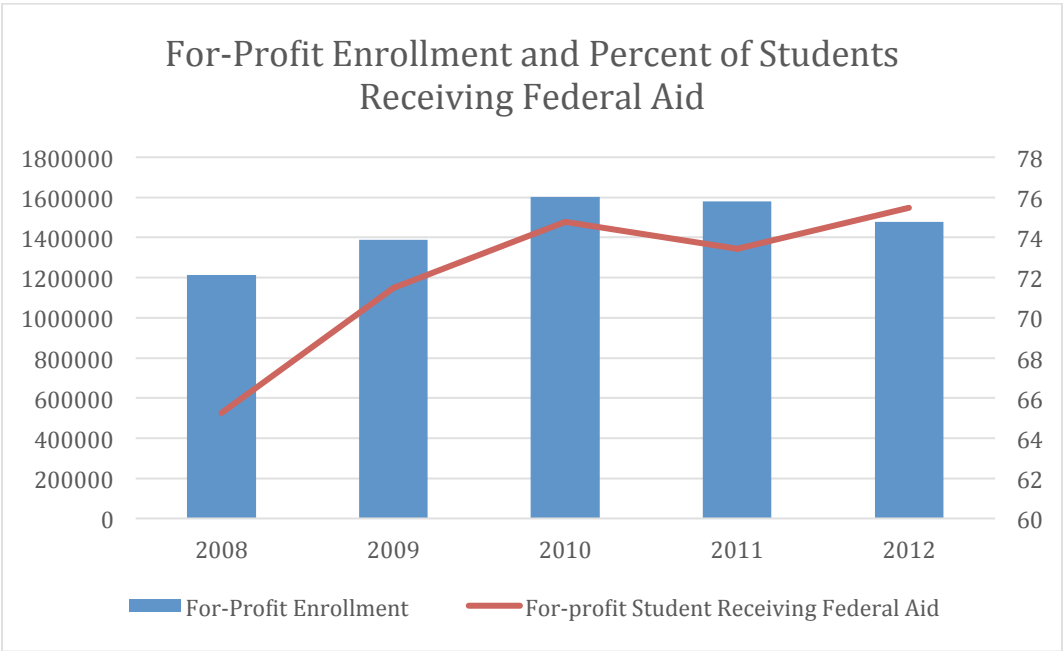
Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Figure 5:



Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Figure 6:



Source: U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Figure 7:

Fixed Effects: For-Profit Schools

Number of observations	=	953			
Number of groups	=	512			
Group Variable:	UnitID				
R-sq:	within	0.0242	Obs per group: min	=	1
	between	0.0247	avg	=	1.9
	overall	0.0163	max	=	2
			F(6,435)	=	1.8
corr(u_i, Xb)	=	-0.3415	Prob > F	=	0.0972

Graduation Rates	Coef.	Std. Error	t	P>|t|	95% Confidence Interval	
Revenuestudent	-0.0003	0.0004	-0.76	0.446	-0.002	0.00052
Studenttuition	-4E-07	0.0005	0.00	0.999	-0.001	0.001
percfed	-0.0932	0.0624	-1.49	0.136	-0.2158	0.029
percdeistance	3.598	1.358	2.65	0.008	0.928	6.267
stfratio	-0.1245	0.1331	-0.93	0.350	-0.3863	0.1372
enroll	0.00014	0.0002	0.57	0.566	-0.0003	0.0006
_cons	46.77	6.866	6.81	0.000	33.275	60.266
sigma_u	19.7583					
sigma_e	9.43					
rho	0.814					

F test that all u_i = 0 : F(511, 435) = 5.81 Prob >F = 0.0000

Figure 8:

Fixed Effects: Non-Profit Private Schools

Number of observations	=	6248			
Number of groups	=	1286			
Group Variable:	UnitID				
R-sq:	within	0.0011	Obs per group: min	=	1
	between	0.0070	avg	=	4.9
	overall	0.0063	max	=	5
			F(4,4958)	=	1.32
corr(u_i, Xb)	=	0.0389	Prob > F	=	0.2600

Graduation Rates	Coef.	Std. Error	t	P>|t|	95% Confidence Interval	
percfed	-0.025	0.017	-1.52	0.129	-0.58	0.007
stfratio	0.062	0.0417	1.48	0.138	-0.02	0.144
enroll	0.0001	0.002	0.7	0.482	-0.0003	0.0005
tuition	-8E-07	7E-05	-0.11	0.911	-0.0002	0.0001
_cons	54.64	2.118	25.79	0.000	50.5	58.8
sigma_u	20.05					
sigma_e	9.33					
rho	0.822					

F test that all u_i = 0 : F(1285,4958) = 11.71 Prob >F = 0.0000

Figure 9:

Fixed Effects: Non-Profit Public Schools

Number of observations	=	3245			
Number of groups	=	655			
Group Variable:	UnitID				
R-sq:	within	0.0208	Obs per group: min	=	1
	between	0.4329	avg	=	5.0
	overall	0.4259	max	=	5
			F(4,2586)	=	13.76
corr(u_i, Xb)	=	0.5506	Prob > F	=	0.0000

Graduation Rates	Coef.	Std. Error	t	P>|t|	95% Confidence Interval	
percfed	0.0064	0.0115	0.56	0.575	-0.016	0.029
stfratio	-0.075	0.0447	-1.68	0.093	-0.163	0.013
enroll	0.0002	9E-05	2.01	0.044	5E-07	0.0003
tuition	0.0005	9E-05	5.69	0.000	0.0004	0.0008
_cons	39.667	1.335	29.71	0.000	37.048	42.285
sigma_u	15.939					
sigma_e	3.59					
rho	0.95					

F test that all u_i = 0 : F(654,2586) = 63.62 Prob >F = 0.0000

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