



Determinantes de las donaciones privadas en universidades rankeadas de los EE.UU. 2011-2020: Un análisis de regresión cuantílica con datos de panel

Determinants of private giving at ranked U.S. universities 2011-2020: A panel data quantile regression analysis

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Resumen

El objetivo de esta investigación es realizar un análisis para identificar qué variables contribuyen a que los estudiantes donen a las universidades de Estados Unidos. Para este estudio, se recopilaron datos de cincuenta universidades estadounidenses, la mayoría de ellas en el cuantil I de The Times Higher Education World University Ranking (THE Ranking). Asimismo, información de los estados financieros e informes anuales de las universidades para el periodo 2011 a 2020 e información de la National Association of College and University Business Officers (NACUBO). Los datos se organizaron en una estructura de datos de panel con una estructura repetida para cada sección transversal. Esta estructura se compone de cincuenta universidades y diez años, como período de tiempo, dando un total de 500 observaciones. Al realizar el análisis correspondiente, podemos encontrar que las variables que contribuyen a las donaciones dependen del crecimiento del PIB estatal, del tipo de universidad, del tamaño de la universidad, de las contribuciones estatales por Estudiantes Equivalentes a Tiempo Completo (ETC), de la puntuación en el ranking, de las desgravaciones fiscales por donaciones. También se han encontrado pruebas empíricas de que las universidades públicas reciben menos donaciones privadas que las privadas. Para esta investigación realizamos un análisis de regresión cuantílica de datos de panel, con el fin de captar con mayor precisión la variabilidad de los datos, ya que las universidades mejor clasificadas son las que reciben más donaciones.

Palabras Clave

Exalumnos, donaciones privadas, educación superior

Abstract

The purpose of this research is to conduct an analysis to identify which variables contribute to student giving to universities in the United States. For this study, data were collected from fifty U.S. universities, most of them in quantile I of The Times Higher Education World University Ranking (THE Ranking) list. Also, information from the universities' financial statements and annual reports for the period 2011 to 2020 and information from the National Association of College and University Business Officers (NACUBO). The data were arranged in a panel data structure with a repeated structure for each cross-section. This structure is composed of fifty universities and ten years, as a time period, giving a total of 500 observations. When we perform the corresponding analysis, we can find that the

variables that contribute to donations depend on the growth of State GDP, the type of university, university size, state contributions by Full Time Equivalent Students (FTE), the ranking score, tax rebates due to donations. Empirical evidence has also been found in which public universities receive less private giving than private universities. For this research we performed a panel data quantile regression analysis, to more accurately capture the variability of the data because top-ranked universities receive the most donations.

Keywords

alumni, private giving, higher education

I Introduction

Statistics concerning the year 2018, corresponding to 10 universities in the United States (U.S.), show that, in that fiscal year, a total of 46.73 billion dollars were collected in the U.S. by way of donations, with the top three universities receiving the largest donations: Harvard University with 1.42 billion dollars followed by Stanford University and Columbia with 1.10 and 1.01 billion dollars respectively (Voluntary Support of Education Survey, 2019). This contribution of resources has an impact on the country's economy, as according to statistics prepared and disseminated by the Voluntary Support of Education (VSE), they estimate that colleges and universities in the U.S. raised more than \$ 49.60 billion dollars during the academic fiscal year corresponding to the years 2018 - 2019 from donations, which was 11.20 billion million dollars made by Alumni which represents 22.6% of the total collection (Snijders et al., 2019; Belfield & Beney, 2000; Leslie and Ramey, 1988). We can also consider that, according to the aforementioned statistics, the faculties of the universities that collect the most from donations are Business and Law, and the remaining percentage is represented by corporations, foundations, individual donations, among other organizations (Khanna et al., 2019; Kim et al., 2016). These donations have an important contribution to the GDP of a country, for example, we can comment that, in studies conducted, donations in Universities in the United States contribute 1.44% to GDP followed by New Zealand, Canada and the United Kingdom with 0.79%, 0.77% and 0.54% respectively. On the other hand, in Latin America, if we take into account the previous study, only Mexico figures with 0.03% contribution to GDP (Gross Domestic Philanthropy, 2016). Other studies conducted in Lithuania during the concerning period between the years 2010 - 2016 show that higher education institutions contribute to the economy with an average GDP around 298.48 million euros. (Vaiciukevičiūtė et al., 2019).

On the other hand, Iskhakova et al., (2017) comment that Alumni could be considered as a great source of support for their alma mater in areas such as volunteering (e.g., mentoring), information, donations, investment and networking and will probably depend on the quality of the university's teaching prior to the end of studies to make these donations. The goodwill of alumni is important because organizations can potentially reap benefits, which is positively related to higher salaries and greater responsibility in their next jobs. (Raghuram et al, 2017). Likewise, in Latin America a considerable amount of universities obtain operational income basically from tuition fees, unlike North American universities, It can be commented that for example in Colombia more than 80% of the total resources are generated by academic income, of which 70% are equivalent to tuition and the remaining correspond to other academic fees, such as sale of services, research and continuing education, the remaining 13% is distributed between financial returns and other income, credits and resources (Ayala, 2010).

Therefore, the objective of this article is to identify the variables that may affect private donations to universities in that country. We believe that by first analyzing U.S. universities, the phenomenon of donations to universities can be understood in greater depth, due to the development of the culture of donations in that country (Cho et al, 2019).

2 Theoretical background and hypothesis

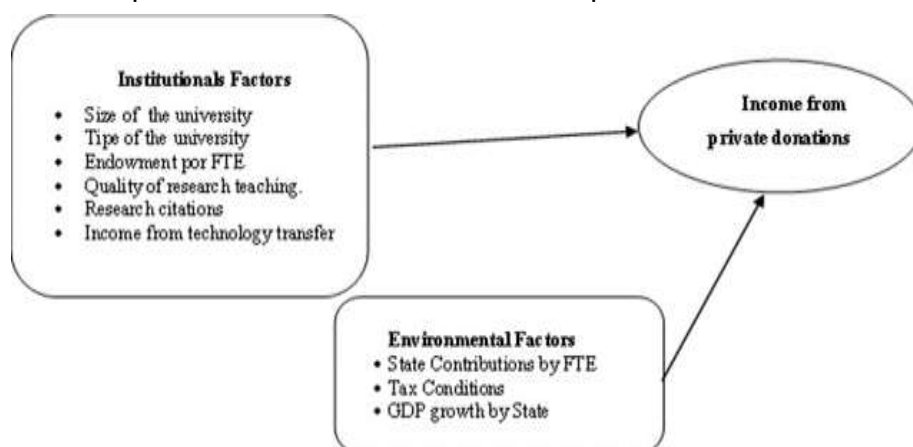
Within the review we can comment that there are studies of empirical analysis related to the research topic, as well as descriptive and mixed methods research. Some research has the alumni as the main donor according to studies by Demange et al., 2020; Weerts & Ronca, 2008; Plewa et al., 2005 and other studies analyze variables related to the institutional level of the environment as a factor that could influence donations such as research by Holmes (2009) y Liu (2006). It should be considered that the methodologies used have been predominantly those of Structural Equation Models, descriptive studies, panel data, binomial logistic regression. These studies consider variables such as: sociodemographic characteristics, civic or religious commitments, academic commitment, social commitment, first year academic residence, financial ratios, efforts of foreign entities, alumni attitudes, previous commitment to the university, support, trust, attitude towards donation, fiscal incentives, philanthropy. The contribution of this study is to analyze the phenomenon at the institutional level as there are numerous investigations conducted at the individual level.

Donations from universities are mostly reflected by Alumni which are monetary donations after graduation (Castilla and Rissing, 2019), and non-monetary donations (Time, volunteering, etc). It is worth mentioning that donations include contributions received by the institution in the form of cash, securities, company products and other goods (Strategic Performance Hub Glossary, 2017). Grants are essential resources for public and private universities in the United States. They allow universities to make new investments, such as developing educational courses (McClure, 2015), improving academic research (Ohman et al., 2016).

According to Liu (2006), the variables that influence private donations to universities can be divided into institutional and environmental. Among the institutional variables, this author finds as relevant the size of universities, type of institution, quality of institution measured as position in international rankings such as the UE News & World Report Ranking, as well as operational income per FTE including state contributions (State appropriation).

Building upon the literature review and the foundational model proposed by Liu (2006), this study identifies several institutional and environmental factors that may significantly influence private donation income at universities. These factors include the size of the institution, its ranking, economic conditions, and the type of university. The model developed for this study, which incorporates these variables, is presented in Figure 1 below. By integrating these factors, the model aims to provide a comprehensive framework for understanding the dynamics of private giving within the context of U.S. higher education.

Figure 1. Independent variables that influence the dependent variables.



2.1 Institutional Factors

2.1.1 Size of the university

McAlexander & Koenig (2010) found that alumni belonging to smaller institutions feel more integrated and inclined to support their university community than graduates of larger institutions. To characterize

university size, as a possible variable influencing giving, according to Prinz & Ehrmann (2022) universities with high core assets, (in the US, as well as 'Oxbridge' in the UK) had a competitive advantage. First, they provided resources for research. Here again, foundation assets make a difference. For these reasons, owning such assets can be the decisive advantage to become a top university. For the model, university size is measured by Total Assets, expressed in thousands of dollars.

H1: University size has a significant impact on income from private donations.

2.1.2 Type of university

The university type variable to characterize the effect that being a public or private type university might have. The 2019 results were unevenly distributed across institution types. Giving to public baccalaureate institutions increased by 29.5%, well above the average growth rate. In the group of 44 public baccalaureate institutions, 39.7% of the total was raised by two institutions. They are the United States Military Academy and the United States Air Force Academy. Private research/doctoral institutions also fared better than average. They collected 14.9% more in 2019 than the previous year (Kaplan, 2019).

H2: The type of university has a significant impact on income from private donations.

2.1.3 Endowment History

According to Baum & Lee (2018), Endowments provide income that supplements tuition and fees, state appropriations, and other funding sources to support undergraduate and graduate student education, as well as research, public service, and other institutional activities. Endowments provide monies that safeguard institutional budgets from cyclical pressures, unanticipated enrollment shifts, and other temporary revenue interruptions.

Notes Liu, (2006) Institutional quality, as reflected in per-student expenditures, and past fundraising success, as reflected in the per-student endowment, are important to non-alumni donors, but not to donors.

H3: Endowment per FTE significantly impacts on income from private donations.

2.1.4 University Prestige

It should be noted that The Times Higher Education (THE) considers research as well as research quality, income, and reputation.

Payne (2001) used longitudinal data on donations to research universities and federal research grants from 1972 to 1997 and found a positive relationship between donations and federal research grants for U.S. research universities.

Recent studies comment that the academic program has a positive influence towards Alumni increasing their competencies, career development, new positions and better salaries (Kismul et al., 2020 and Andrade et al., 2020). There is also research that concludes that student loyalty is significantly affected by the quality of the teaching-learning process, student satisfaction has a positive and significant influence, and that the external support network is a significant variable that directly and indirectly impacts student "loyalty" (Drezner & Pizmony-Levy, 2021; Drezner et al., 2020 and Cabana et al., 2016). Also according to THE comments that the teaching environment is evaluated by the ratio of professors with doctoral degrees, awards in doctoral programs, staff supporting students, as well as institutional income.

Conversely, McDearmon and Shirley (2009) observed a significant relationship between alumni decisions not to donate and their overall experience at the institution, which is influenced by the quality of teaching and the size of the institution. Figure 2 presents data from 2010 to 2020, illustrating the amount of donations received by universities relative to their size.

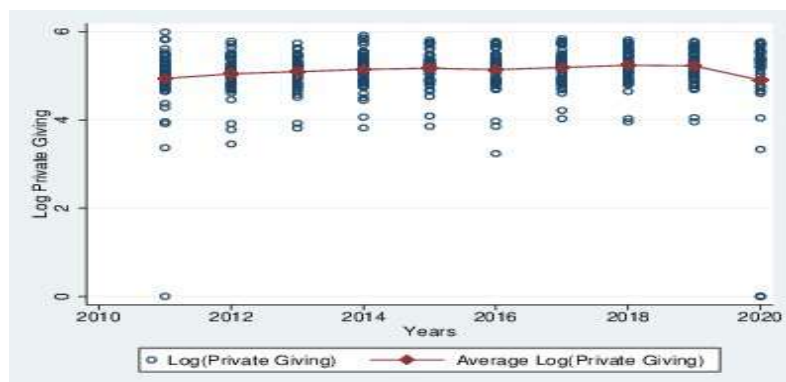


Figure 2. Size of the educational institution.

2.2 Environmental Factors

2.2.1 Economic growth

According to Liu (2006), private donations seem to closely follow economic trends in general. Given the differences in the motivations of different groups of donors, it is reasonable to expect that corporations tend to donate less in times of economic downturn, while individuals appear to be unaffected by fluctuations in the economy and are more likely to respond to the particular needs of an institution when making contribution decisions.

Economic indicators point to broad philanthropic growth in the coming years, provided that the region's GDP remains on track to recover to pre-pandemic levels (Ware, 2021).

According to Prinz et al. (2022), the number of top-tier universities in the UK and Switzerland seems to be compatible with the (relative) size of their economies, as the UK's GDP is 4.00 times that of Switzerland (GDP data are from World Bank, 2019). The German economy is larger than that of the UK and 5.67 times that of Switzerland. Compared to its GDP, Germany should have about six universities in the same range as Switzerland and the UK. France's GDP is 3.86 times that of Switzerland and could have a commensurate number of top universities. In addition, China's GDP is 19.29 times that of Switzerland; it could have about 20 universities in the top rank if the distribution of universities of equal rank were proportional to the countries' GDP. For comparison, the GDP of the USA is 29.05 times higher than the GDP of Switzerland and therefore could have 29 universities in the same rank as Switzerland. According to the Shanghai University rankings, the U.S., the U.K. and Switzerland have much higher ranked universities compared to their GDPs. China and Germany, on the other hand, have universities ranked lower than expected for their GDPs.

According to Fraumeni, (2017) For most people, one main number, usually quarterly or annual GDP growth, is more than enough to focus on when considering the economic condition of a country. Likewise Six factors, comprising GDP levels, life expectancy, generosity, social support, freedom and corruption, are subcomponents of the happiness measure. Generosity is measured by: recent donations; social support (having someone to count on in times of difficulty).

H5: GDP growth by state has a significant impact on income from private donations.

2.2.2 State Contributions

According to Marudas and Jacob (2004) comment that public funding can be a positive signal to potential individuals who wish to donate to potential donors, which crowds out private donations.

H6: State contributions per FTE (student) significantly impact private donation income.

2.2.3 Tax Conditions

The U.S. federal tax system provides unique tax benefits for gifts of appreciated property, such as stock, land, or real estate, to U.S. universities (Fukui, 2021). U.S. donors in this situation obtain the following tax benefits: first, they can deduct the fair market value of these gifts of appreciated property from their taxable income and, second, they are exempt from paying capital gains tax (Andreoni & Payne, 2003).

H7: Tax conditions have a significant impact on private gift income.

Among the environmental variables, this author also includes state income per capita. tax deduction rates for endowments are also relevant, in agreement with Holmes (2009).

Irvin (2010) commented that endowments are substantial assets that enable organizations, including universities, to excel in their activities. Endowments have generally been used by universities in the U.S. and Canada to ensure the continuity and sustainability of teaching and research activities. It should be noted that the largest endowment fund for an educational institution is that held by Harvard University, with almost US\$40 billion. These funds are managed in such a way that they can nurture economic resources from the generation of financial income, but are generally intangible in terms of capital.

Endowment growth by FTE had a positive effect on the ratio of total private giving to total revenue (0.24), total private giving (0.13), and alumni (0.25). This suggests that institutions with a tradition of private support have a higher ratio of total private giving to total revenue. (Liu, 2006)

Information on tax deductions that apply to donations by state has also been used. It should be noted that in the U.S., taxes and deductions for donations are treated differently depending on the state. Thus, there are states that do not offer any tax benefits, and others offer discount rates, deductions or tax credits of up to 13% of the tax base (U.S. Charitable Gift Trust, n.d.).

3 Methodology

3.1 Sample and data

As has been discussed, the factors that influence donations to universities are grouped into institutional and environmental. As for institutional factors, these relate to the capabilities of universities to compete locally and globally. University rankings collect information that accounts for the distinctive capabilities of universities as they strive to differentiate themselves (Musselin, 2018). Rankings can also be useful for providing information regarding institutional performance and productivity (Prisyanti et al., 2020; Urdari et al., 2017), and for student and faculty decision-making (Sobral, 2021).

Data were collected from 50 U.S. universities, which have regular participation in the Times Higher Education World University Ranking (THE Ranking) in the period 2011-2020 and which are normally placed in the 1st and 2nd quartiles of the ranking. It should be noted that the number of North American universities listed in the THE Ranking has been varying in recent years. Thus, in 2011 there were 72 universities listed, while in 2020 there were 172, because the number of universities included in the ranking went from 402 in 2011 to 1,397 in 2020.

The period chosen includes the years in which it was possible to obtain information on institutional indicators included in the THE Ranking to build a panel of data, since the THE Ranking has information published since September 2010 (Altbach, 2012; Times Higher Education, 2019). Likewise, the inclusion of data from THE Ranking indicators is supported by existing evidence from research that relates university prestige to donations received by alumni (Holmes, 2009; Baruch & Sang, 2012; Faria et al., 2018).

To achieve the research objectives, a panel data structure was created with eleven independent variables and one dependent variable. The purpose of this type of analysis was to capture the heterogeneity (Bjorn, 2017) between universities over a ten-year period in order to verify the effects of the variables identified in the conceptual framework on donations during that period. In this sense, a repeated structure was formed for each cross-section within the period from 2011 to 2020, according to the specifications of Wooldridge (2010) and Pindado & Requejo (2014). Said structure is composed of observations from fifty North American universities, in 24 U.S. states and ten years, as a time period, giving a total of 500 observations and 12 variables.

3.2 Research Design

This study is based on empirical analysis which aims to generate evidence on the determinants of private giving at ranked U.S. universities from 2011 to 2020. Likewise, quantitative methods have been used for this study to analyse the data and verify hypotheses. A panel data structure with repeated measures over a ten-year period was used, involving 50 U.S. universities. This design helps capture the variability of the data and allows for the analysis of variables that contribute to donations.

3.3 Measurements and analysis

The THE Ranking score has been considered among the variables for measuring institutional factors, as proposed in the research by Liu (2006) and Holmes (2009). Likewise, the size of the university has been considered as part of the institutional factors based on the number of FTE students, in accordance with research that analyses the relationship between this variable and the willingness to donate on the part of alumni and students (Liu 2006; Mc Alexander & Koenig, 2010) and the analysis of the size of the organization based on the quantification of its assets, in accordance with Vijn & Yang (2013), Gonzalez (2013), among others. In addition, the variable Endowment per FTE has been included, which records the amount of Endowment Funds divided by the total number of Full Time Equivalent students enrolled in each year, which is also presented in Liu (2006). Endowment Funds data were collected from Historic Endowment Study Data reports (NACUBO, 2021) and data on the amount of FTE students were estimated from annual enrollment reports for each university and the formula provided by *Organization for Economic Co-operation and Development OECD* (2003).

Table I. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Log Donaciones	500	5.108	.624	0	5.991
GDP Growth	500	.016	.022	-.059	.072
DTAX	500	.46	.499	0	1
Log Assets	500	6.938	.359	6.048	7.886
FTE Students	500	27415.697	15276.85	2181	73378
Log State Contrib. per FTE	500	3.799	.172	3.264	4.475
Log Endowments per FTE	500	2.129	.687	.619	5.143
THE Ranking score	487	70.407	15.86	11	96.1
Type of University	500	.52	.5	0	1

Nota: The variable THE ranking has missing data, because between 2014 to 2011 some universities were not classified in the ranking (Colorado State University, Kent State University, The State University of New York, Colorado State University, Texas State University, Texas A&M University and University of Texas at Austin).

Within the environmental factors, state economic growth (Holmes, 2009) and state FTE student contributions were included, in accordance with the contribution of Liu (2006). Likewise, the control variable tax deduction for donations was incorporated to compare the evidence found in studies such as those conducted by McGregor-Lowndes et al., (2006); Gutrie et al., (2008), and Holmes (2009), which show that there is not necessarily a direct effect between tax rates and private donations,

but rather differentiated effects. Among the sources consulted are the National Science Foundation, the U.S. Charitable Gift Trust and the Bureau of Economic Analysis.

The model to analyze the relationships between private donations to universities and the two levels of determinants identified in the literature is specified below. The dependent variable is the logarithm of private income from donations obtained by the universities (contributions, gifts and pledges, among others), both operating and non-operating. This information was obtained from the financial statements of each university, specifically from the statement of activities.

The explanatory variables concentrate information both at the contextual or environmental level and at the institutional level. The THE Ranking score was obtained from the World University Ranking classification for each year. This score is calculated from the weighted average of the scores in the categories Teaching Quality (30%), Research (30%), Citations (30%), International Outlook (7.5%) and Industry Income (2.5%). The variable endowments per FTE was log-transformed to reduce extreme values and improve parameter estimation in the model (Leydesdorff & Bensman, 2006), as were the state contributions per FTE. The data referring to total assets were collected by reviewing the Balance Sheets of each of the universities, and the

logarithm of the value of total assets for each year was included. Table I shows descriptive statistics for the variables studied.

To validate the hypotheses we use panel data analysis and quantile regression, which represents an innovation in the methodology used to analyze university donations, since previous research has employed methodologies such as OLS regressions and Logit/Probit Models (Liu, 2006; Holmes 2009; Weerts & Ronca, 2008), Structural Equation Modelling (Plewa et al., 2005; Francioni et al., 2020) and cohort and descriptive studies (Moore & Kuol, 2007; Clotfelter, 2003; Demange et al., 2020), or MANOVA analysis (McAlexander & Koenig, 2010).

Different analyses were carried out with the data collected. First, a graphical analysis was carried out, reviewing the values of donations for different quantiles. Figure 3 shows that a higher concentration of donation income occurs in the lowest quantile. Pooled regression, panel data fixed and random effects analyses were also carried out to estimate the model parameters. Different tests were performed to test for autocorrelation and heteroscedasticity and the model parameters were estimated using quantile regressions to analyze the differences in the highest versus lowest quantiles for donations. STATA statistical software was used to perform this analysis.

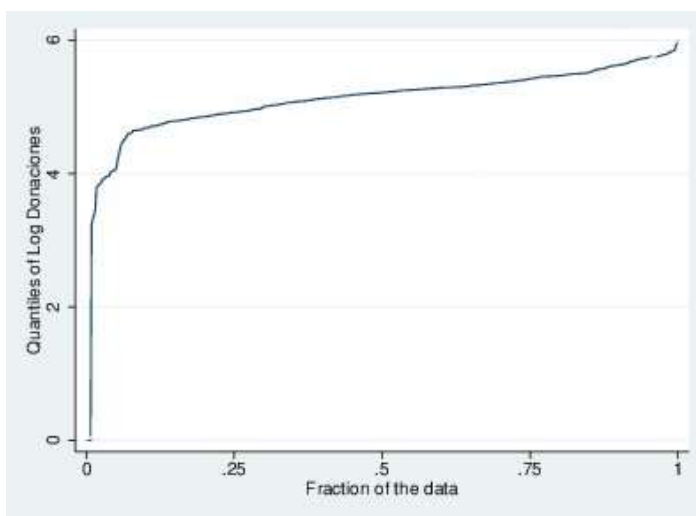


Figure 3. Donations income per quantiles.

4 Results

Table 2 shows the estimation of the correlation matrix. It is verified that most of the independent variables are correlated with the dependent variable. Two preliminary analyses were also carried out. First, the model was estimated with Pooled OLS specifications and the Lagrange Multiplier test was performed to know whether it was convenient to keep an OLS or Panel Data model. A p-value of less than 0.05 was obtained, so it was decided to continue the analysis with panel data. Subsequently, the Pesaran test was carried out to check for cross-sectional dependence (CSD) given the configuration of cross-sectional units and time-series observations (De Hoyos & Sarafidis, 2006).

Subsequently, the Hausman test was performed to establish whether it was convenient to use a fixed or random effects model. A p-value of 0.097 was obtained, so the null hypothesis was rejected and therefore the Random Effects and Fixed Effects models lead to the same results. The First Order Autocorrelation and Heteroscedasticity tests were also performed. The heteroscedasticity scenario suggests that the linear model does not efficiently capture the variability of the data, given the existence of outliers, and the existing differences between individuals. One way to address this problem is through Quantile Regression, precisely Konstantopoulos et al. (2019) suggest that typical regression models do not provide information about the effects of the independent variables on multiple sections of the dependent variable, when it is common that in education-related research it is of interest to have information regarding different groups.

Table 2. Correlation matrix model.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Log Donaciones	1.000								
(2) GDP Growth	0.076 (0.089)	1.000							
(3) Log Assets	0.485* (0.000)	-0.140* (0.002)	1.000						
(4) FTE Students	-0.081 (0.069)	0.061 (0.170)	-0.137* (0.002)	1.000					
(5) Log State.. pe~E	0.152* (0.001)	-0.143* (0.001)	0.284* (0.000)	-0.236* (0.000)	1.000				
(6) Log Endowments~E	0.414* (0.000)	-0.136* (0.002)	0.657* (0.000)	-0.584* (0.000)	0.236* (0.000)	1.000			
(7) THE Ranking score	0.398* (0.000)	-0.050 (0.271)	0.596* (0.000)	-0.289* (0.000)	0.291* (0.000)	0.534* (0.000)	1.000		
(8) DTAX	0.081 (0.069)	0.087 (0.053)	0.040 (0.373)	-0.111* (0.013)	0.303* (0.000)	-0.091* (0.042)	0.070 (0.122)	1.000	
(9) Type of Univer~y	-0.316* (0.000)	0.112* (0.012)	-0.358* (0.000)	0.705* (0.000)	-0.324* (0.000)	-0.721* (0.000)	-0.418* (0.000)	0.003 (0.943)	1.000

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

An additional model was formulated with regressions at the 25th, 50th and 75th quantiles. A first exploration consisted of graphically analyzing the coefficients according to the different scenarios of quantile regressions. Figure 4 shows visually the coefficients of the quantile regressions. It is observed that as one moves up the quantiles, the coefficients of the GDP Growth, Size (Assets and FTE Students) and State contribution per FTE variables decrease; while in the case of the ranking score the coefficient increases.

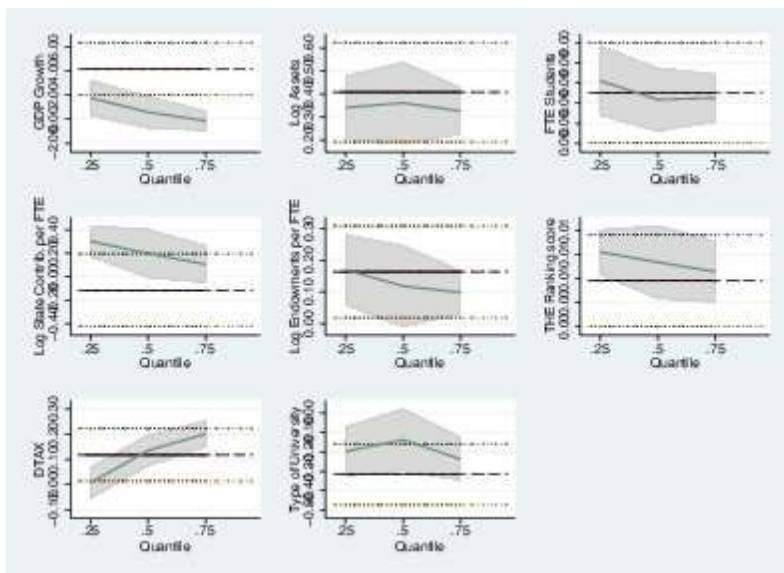
**Figure 4.** Coefficients per quantiles

Table 3 shows that the variables GDP Growth, Assets (Log), FTE Students, Ranking and type of university are significant in the models with random effects regressions, and in the different quantiles analyzed. Therefore, it is possible to accept hypotheses H5, H1, H4 and H2, respectively. No empirical evidence was found for the random effects model with respect to Hypotheses H3, H6 and H7. The regression is also presented for the 25th, 50th and 75th quantiles. It is verified that for the 25th and 75th quantile, all variables are significant. In contrast, at the 50th quantile, all variables were significant except for Endowments by FTE. In addition, Table 3 shows how the coefficients of the independent variables vary according to the quantiles analyzed.

Table 3. Panel quantile.

VARIABLES	(1) POLS	(2) Fixed Effects	(3) Random Effects	(4) Q.25	(5) Q.50	(6) Q.75
GDP Growth	4.185** (1.985)	5.002* (2.495)	4.922** (2.309)	1.988*** (0.237)	-0.846** (0.383)	1.725*** (0.549)
Log Assets	0.409*** (0.0949)	-0.276 (0.534)	0.452** (0.177)	0.346*** (0.00869)	0.693*** (0.100)	0.288*** (0.0227)
FTE Students	1.11e-05*** (2.03e-06)	-1.65e-05** (6.92e-06)	8.09e-06** (3.72e-06)	1.27e-05*** (2.30e-07)	5.10e-06*** (1.77e-06)	9.72e-06*** (5.40e-07)
Log State Contrib. per FTE	-0.116 (0.183)	1.309*** (0.380)	0.0349 (0.168)	0.187*** (0.0224)	0.454*** (0.105)	0.663*** (0.111)
Log Endowments per FTE	0.164*** (0.0599)	0.0239 (0.0761)	0.114 (0.104)	0.138*** (0.00538)	0.0354 (0.0296)	0.0675*** (0.0235)
THE Ranking score	0.00580*** (0.00128)	0.00542 (0.00453)	0.00572*** (0.00190)	0.00931*** (0.000169)	0.00333*** (0.00126)	0.00695*** (0.000455)
DTAX	0.118** (0.0493)		0.0879 (0.0856)	0.0221*** (0.00591)	0.117*** (0.0114)	0.0596** (0.0300)
Type of University	-0.316*** (0.0672)		-0.277** (0.124)	-0.229*** (0.00698)	-0.0539* (0.0311)	-0.166*** (0.0384)
DTAX = α .		-				
Type of University = α .		-				
Constant	1.698** (0.801)	2.005 (2.469)	1.006 (1.112)			
Observations	487	487	487	487	487	487
R-squared	0.302	0.060				
Number of ID2		50	50			
Number of groups				50	50	50

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5 Discussion

The results of our study corroborate with evidence that factors such as the economic growth of regions, in this case states, have an effect on the amounts of donations that private organizations and individuals give to universities. Moreover, our study shows that this variable is the most important, due to the marginal size of the effect that is achieved in its variation. Even in the three models: Pooled OLS, Fixed Effects and Random Effects, it maintains the highest coefficient. This result is relevant on the logic that if the economy improves, the income of donors also improves, and therefore the possibility of donors giving part of their surpluses to organizations such as universities increases.

Likewise, the position of universities in the THE ranking turns out to be significant in almost all the regression scenarios proposed in this study. Furthermore, the marginal effect of this variable remains almost constant for all the models analyzed. This stability in the results allows us to corroborate the results obtained in other studies (Liu, 2006; Faria et al., 2018), as well as theoretical approaches referred to the effect that university prestige has on the decisions made by economic agents who donate or potentially may donate to universities (Hamdullahpur, 2021). In this sense, we have found evidence that supports these propositions, and it is possible to affirm that the position of the university in the ranking (and its appearance in the ranking) are relevant for obtaining income from donations.

The size of the university measured in terms of assets and amount of FTE Students is significant and its marginal contribution is the second highest behind the growth of the state's economy. These results corroborate those obtained in research such as those developed by Yan & Sloan (2016) regarding the influence of total assets on donations received and those of McAlexander & Koenig (2010) regarding the number of students in universities receiving donations.

In this study we also found empirical evidence regarding the type of university having an effect on donations. From our analysis it is possible to establish that the type of university has an influence on donations. Moreover, the marginal effect is negative for public universities. This result contradicts the empirical results obtained by Harrison et al. (1995), in that the type of university does not influence donations received, while it coincides with the theoretical approach of Monks (2007).

Regarding Endowments funds per FTE, State contributions per FTE and Tax Conditions, these variables were significant in quantiles 1 (.25) and 3(.75), precisely in the scenarios of higher donations and lower donations. That is, in quantiles 1 and 3 it is possible to accept hypotheses H6, which corroborates the

results obtained by Marudas & Jacobs (2004); H3, which confirms the results obtained by Liu (2006) and Faria et al. (2018); H7, confirms the results obtained by Holmes (2009).

5.1 Practical Implications

As has been seen, the income received by universities in the U.S. is significantly and importantly influenced by the rate of economic growth in the geographic area where they have influence. This implies that if the economy of the geographic area where the major donors come from improves, then donations are expected to increase as well. Although the study only covers universities in the U.S., it is important to consider this variable as relevant when estimating the revenue budget of universities, as long as they consider donations as part of that revenue. However, as this income decreases, so does its relative importance, to the point that in the lower quantiles its marginal effect is relegated to lower levels of importance.

Moreover, the scenario posed by the quantile regression estimates at quantile 3 (75) suggests that when income from donations is scarce, variables such as total assets become more relevant, but mainly the information that the donor has regarding the investment that the university makes with its donations. In the case of the variables that try to measure the size of the institution, although evidence has been obtained to corroborate that those universities that are larger receive more income from donations, the type of variable used to approach this verification is relevant, since the variable that has the greatest marginal contribution is precisely the value of the assets, information that was obtained after a review of the annual financial reports of each of the universities. Possibly, donors consider the information in these reports in their decision making. This is important in the Latin American context, for example, where there is no culture of transparency of university financial information (Abello-Romero et al., 2021). In countries such as Peru, for example, this information is scarce and of lower quality than in U.S. universities, mainly for public universities, despite the fact that there are norms that attempt to regulate the annual presentation of university financial reports.

Another aspect worth highlighting is that of tax facilities for donors. It is observed that this variable becomes more important in scenarios of lower donation income. This suggests that when income from donations is scarce, having a regulatory framework that favors donations to universities may encourage such donations. Although the study does not cover Latin American countries, nor has a review been made of the tax regulatory frameworks for the countries in the region, the results we show can initiate a debate on the convenience of maintaining or creating tax rules that help to encourage donations to universities.

Finally, the results obtained on hypothesis H2 are promising for private universities. For this type of universities, it is advisable to carry out campaigns to attract donors in order to diversify their sources of income. Although the motivations of donors have not been studied in this research, the results of the work carried out by Webb (2016) and Ehrenberg & Smith (2003) may be useful in a later discussion of these aspects.

6 Conclusions

This research has presented empirical evidence regarding the influence of the variables Economic Growth, university size, THE Ranking score as well as university type on private donations received by a set of universities in the U.S. These results coincide with previous research, but contrast with research that has had contradictory results on the relationship between university type and donations received. Precisely on this last point, we find promising results for private universities.

The quantile regression results offer an additional level of analysis, mainly in scenarios where universities receive more or less donations. In each of these scenarios, we find that the marginal contributions for each variable take on different values. In scenarios with less income from donations, variables such as the size of the universities, measured by the size of their assets, become more important, which is why it is important for this information to be transparent so that it can be useful to potential donors.

This study faces several limitations that should be acknowledged. Firstly, the geographical limitation is significant, as the research team is based in Peru, which may affect the contextual understanding of certain

nuances related to U.S. universities. The analysis focuses solely on institutions within the United States, which may not capture the full spectrum of factors influencing private giving across different countries or educational systems. Additionally, the study period from 2011 to 2020 coincides with the global COVID-19 pandemic, which introduced unprecedented challenges and uncertainties in higher education. The pandemic's impact on economic conditions, donor behavior, and institutional priorities could have influenced the donation patterns observed in this study, and these effects might not be fully captured in the analysis. Future research could benefit from exploring these variables in different geographic contexts and extending the timeframe to assess the long-term effects of the pandemic on private giving to universities.

7 Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

8 Author Contributions

Conceptualization, V.P. and C.D.; methodology, V.P.; software, C.D.; validation, C.D.; formal analysis, C.D.; resources, V.P. and C.D.; writing—original draft preparation, V.P. and C.D.; writing—review and editing, V.P. and C.D.; visualization, V.P. and C.D.; All authors have read and agreed to the published version of the manuscript.

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