



Affordable Higher Education in Mexico:

Implications for Career Advancement and Social Mobility

Final Evaluation Report – April, 2015

Prepared for:



Acknowledgements

The core team for developing this evaluation of “*Affordable Higher Education in Mexico: Implications for Career Advancement and Social Mobility*” was led by Miguel Angel Rebolledo Dellepiane (IFC) and Gloria Paniagua (IFC); it included Matthew Yale, Sandra Perez, and Debora Moran from Laureate; Mohammed Ali Khan, Damian Olive, Alexis Diamond, Ines Gutierrez, and Daniel Shepherd from IFC; and Raul Abreu, Braulio Torres, Alexandro Maya, and Amlin Charles from C230 Consultores.

The framework benefited from several rounds of reviews by Prof. Gary King and Patrick Lamb from Beecher Analysis Group.

Useful input and guidance for the evaluation was provided by the following IFC colleagues: Atul Mehta, Elena Sterlin, Salah-Eddine Kandri, Juliana Guaqueta Ospina, James Emery, Hayat Abdulahi Abdo, Mary Porter Peschka, Micheline M. Ntiru, Irene Arias, Eduardo Wallentin, Toshiya Masuoka, Luke Haggarty, Claudio Volonte, and Deepa Chrakrapani.

The team wishes to thank all contributors and reviewers for their input and collaborative spirit.

C230 Consultores takes responsibility for any mistake or omission within the report.

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0. Executive Summary

The main purpose of this research is to assess the performance of Laureate graduates¹ in the labor market and their avenues for social mobility, vis-à-vis their peers from other universities.

Laureate universities offer higher education degrees in the Mexican context, an environment where there is a significant, unmet demand for college degrees and yet, private universities face a highly competitive market to expand their services. This study is an *ex-post* impact evaluation. Namely, it was planned and implemented, years after the individuals participating in this study enrolled and graduated from college, cancelling the possibility of having baseline information available. Thus, the study relies on data collected directly from the field, including a college graduate's survey, an employer's survey, and in-depth interviews to Laureate former students. The analysis is based on a quasi-experimental approach for an impact evaluation, complemented with descriptive statistics and qualitative information.

The outcome results assessed in this report can be grouped into three categories: a) Economic Capital and Employment, which refers to various aspects of the alumni's professional career and income generation after graduation; b) Career Advancement, which measures ability to be promoted and access to managerial positions, and c) Social Progress, which captures the change in an individual's position within a power hierarchy via occupational prestige and the change in socioeconomic levels during shorter periods of time (as opposed to an intergenerational change).

The impact evaluation relied on comparing outcomes from a treatment group (UVM and UNITEC) to a control group (other private and public universities), defined in close consultation with the International Finance Corporation (IFC) and Laureate International Universities (Laureate). The treatment group included individuals, who enrolled in and graduated from the traditional bachelor degrees offered by UVM and UNITEC.² More precisely, it included those individuals between the ages of 17 and 21 years old at the time of enrollment (during the years 2005, 2006 and 2007), who attended a Laureate institution located in the Mexico City's Metropolitan Area (MCMA). Two different comparison groups were proposed:

1. A group of individuals who graduated from other (non-Laureate) universities, which includes both public and private institutions.
2. A group of individuals who graduated only from (non-Laureate) private universities.

Both control groups are formed by college graduates, from other universities in the MCMA with similar characteristics to Laureate graduates prior to enrollment. Namely, these are students who could potentially have joined a Laureate institution, but chose the alternative. The majority of this group attended either UNAM or IPN (64%), a third of them graduated from a private financially accessible college (27%), 7% attended another public university, and 2% graduated from a private premium university.

Matching estimates assume that all relevant variables, or covariates, can be observed and account for all pre-treatment differences across the treatment and control groups. Moreover, such covariates should not be affected by the treatment. In this case, the pre-treatment observable variables that meet these conditions are: gender, age, year of enrollment, household socioeconomic status, parents' educational background, employment status before a student's enrollment, and high school's type.³ The impact evaluation was implemented by conducting a one-to-one matching with replacement following a genetic search algorithm.

¹ For purpose of this study, the term "graduate" refers to individuals who have finished their college studies, undergraduate or bachelor's degree. Throughout the document the terms "Laureate alumni", "Laureate graduates", and "Laureate undergraduates" are used as synonyms.

² Online bachelor degrees and executive bachelor degrees were excluded from the study.

³ Graduating from a public or private high school.

Through the evaluation, it was possible to identify significant impacts of a Laureate education in most of the analyzed outcome variables. In general, when compared to the control group, the most robust results show that Laureate has a positive effect in aspects such as:⁴

- Employability: Laureate graduates spent less time when searching for their first job after graduation than their counterparts in other private and public universities. Particularly, UNITEC's graduates show a higher employment rate than graduates from other private universities.
- Income and job quality: More graduates from Laureate universities have income higher than their counterparts.
- Career advancement: More Laureate graduates were recently promoted and were likely to hold management positions than professionals in the control group. UVM's graduates show a particularly high likelihood of being recently promoted.
- Gender gaps: Female graduates from Laureate, both in UVM and UNITEC, were more likely to hold management positions than females in the control group.
- Social progress: More Laureate graduates have moved upward from their previous socioeconomic status (based on their household's socioeconomic level) than their counterparts. Furthermore, a higher number of Laureate graduates registered positive changes in their occupational prestige, compared to their parents.
- UNITEC graduates' avenues to social mobility are driven mainly by higher income. UVM graduates' avenues to social mobility are driven mainly by gains in occupational prestige.

The results are consistent across both control groups, both in the group formed by public and private universities and the group consisting only of private universities. However, effects are stronger when comparing the treatment group to the private universities only. Negative impacts were also found. Laureate alumni spent more time unemployed since graduation and they find their bachelor's studies less useful for their professional life than their counterparts. In general, the main findings are consistent and reinforce each other. A correlation analysis (presented in Appendix 2. Quasi-Experimental Impact Evaluation (based on Graduates' Survey), section D) shows that those graduates, who spent less time looking for their first job after college are more likely to have been promoted recently, and to be holding a management position. They also tend to be more satisfied with their jobs, have a higher income and spent shorter periods of time unemployed.

Moreover, the gender distribution allowed for the analysis of the differences in the impact a Laureate's education had on male and females. The evaluation results revealed clear signs that Laureate has a higher impact on women's careers. While the effects on men are significant and robust, effects are many times larger for women. Both UVM and UNITEC seem to be contributing to closing the gender gap in career advancement.

Additionally, Laureate graduates show greater social mobility than their peers, relative to their family background. For UNITEC, this is particularly significant, provided that their target students come from lower socioeconomic classes. Over one tenth of them were able to join the highest strata after graduation. UNITEC alumni clearly jump to a higher socioeconomic status, which is driven mainly by higher incomes. UVM alumni usually come from more affluent backgrounds and, although they show a significant improvement, it is not as large as UNITEC alumni's. Nonetheless, social mobility in UVM is driven by joining a profession with higher prestige than their parent's.

The job market perceives that Laureate alumni have competitive skills, when compared to undergraduates from other universities, including those in the premium segment. This makes it feasible for recent Laureate graduates to attain a higher-than-average level of compensation and expect promotions in the same time-lapse as their counterparts. Moreover, the flexibility offered by Laureate institutions may be increasing a student's possibilities of receiving a greater amount of on-the-job training before graduation.

Based on qualitative data, the study found that Laureate alumni chose to join either UVM or UNITEC for reasons such as name recognition, the flexibility in the academic system, as well as affordable tuition. They share the perception

⁴ All the results presented in this section refer to a 95% level of statistical significance.

that their degree helped them to enter the job market successfully. However, some of them expressed concerns about being competitive in the long-term, in relation to their peers from non-Laureate top private universities.

This evaluation shows that Laureate universities in Mexico offer access to high quality higher education. While the public sector provides access to higher education to many students, the demand for university degrees is unmet. The private sector has been investing resources to meet such a demand. Particularly, this evaluation demonstrates that Laureate universities in Mexico supply such degrees with positive implications in career advancement and social mobility. Some people (including students) regard public or premium private education as the only viable option. This study proves that Laureate education in Mexico is a viable option and better than other affordable private education alternatives. Laureate alumni who completed a university degree found a good job, are advancing in their career, and are directed towards upward social mobility.

1. Introduction

Mexico is a country with high inequality, characterized by a relatively dynamic middle class, but by significant immobility at the extremes of the distribution.⁵ According to the OECD, Mexico has the highest level of income inequality amongst OECD countries, 52% above the OECD average.⁶ In terms of mobility, 48% of Mexicans in the lowest quintile see no upward mobility in their lifetime. Likewise, 52% of Mexicans in the highest quintile remain there. However, since the 2000s, Mexico has seen large declines in income distribution, with the middle three quintiles of Mexico's social classes showing a strong increase in income share.⁷ As a result, the possibility of social mobility has become all the more relevant throughout the Mexican social classes.

Social mobility is the phenomenon that measures the equal opportunity of a given society. Social mobility refers to a process and to an outcome, where the success of an individual is independent from the home and circumstances in which such individual was born. It is measured by comparing parents' and adult children's socioeconomic standing; the higher the correlation between them, the lower the mobility. In turn, socioeconomic standing is captured most commonly by measuring current income, wealth, occupation or social class.⁸ Social mobility is considered high if the barriers or advantages associated with the background of an individual are low. In other words, any person could move upward or downward the socioeconomic ladder regardless of their parents' status.

There are several factors that may affect social mobility. On the one hand, there are background factors such as household income; parent's education and occupation; family ethnicity and structure; and geographical region, which are inherent characteristics that affect economic outcomes over time, especially on high-inequality societies.⁹ In Mexico, children of parents that completed a college education are five times more likely to continue their education than children with parents that only completed primary studies. Only 6% of Mexicans whose parent has an unskilled manual occupation reached a white collar job, while 41% of Mexicans whose parent has a non-manual occupation reached a white collar job. Furthermore, evidence shows that in Mexico, gender is a factor that also affects social mobility, where there is higher mobility amongst women than amongst men.¹⁰ On the other hand, there are external factors such as investing in human capital, which provide individuals with alternatives to affect their own outcomes.

Investing in human capital increases productivity, which leads to higher earnings and better social standing.¹¹ Accordingly, evidence shows that higher education contributes toward a more mobile society.^{12,13} Obtaining a college degree helps individuals move up in the income distribution relative to their peers.¹⁴ These findings are stronger for people from the lower quintiles in the income distribution and for children with parents who did not enroll in tertiary education.

The literature focuses on two types of specific mobility: income and occupational. The former (typically the domain of economists) is the extent to which an adult's relative ranking in the income distribution is similar to his or her

⁵ Vélez- Grajales et al, "Informe de Movilidad Social en México 2013. Imagina tu Futuro". Centro de Estudios Espinosa Yglesias. Mexico, 2012.

⁶ OECD, "Growing Unequal? Income Distribution and Poverty in OECD Countries". OECD. 2008.

⁷ Ibid.

⁸ Some researches can also refer to "intragenerational mobility" as the changes in a person's income level or occupational status during his or her adult life course.

⁹ Beller, Emily, and Michael Hout. "Intergenerational Social Mobility: The United States in Comparative Perspective." *The Future of Children* 16(2): 19-36. 2006.

¹⁰ Vélez- Grajales et al, "Informe de Movilidad Social en México 2013. Imagina tu Futuro". Centro de Estudios Espinosa Yglesias. Mexico, 2012.

¹¹ Lee, Chun-In, and Gary Solon. "Trends in Intergenerational Income Mobility." NBER Working Papers Series, 2006.

¹² Hout, Michael. "More Universalism, Less Structural Mobility. The American Occupational Structure in the 1980s." *American Journal of Sociology* 93:1358-1400. 1988.

¹³ See also Breen 2004; 2009; Vallet 2004; Beller and Hout 2006.

¹⁴ Ellwood, D., and T. Kane (2000), "Who Is Getting a College Education? Family Background and the Growing Gaps in Enrollment", in S. Danziger and J. Waldfogel (eds.), *Securing the Future: Investing in Children from Birth to College*, Russell Sage Foundation.

parents'. The latter (most often used by sociologists) is the extent to which an individual's type of job resembles that of his or her father or mother.

This report seeks to evaluate social mobility for Mexican undergraduates from Laureate institutions, a private university system, specifically evaluating the effect of a Laureate education on both income and occupational mobility at the individual level by focusing on returns to education as well as other avenues to social mobility (career advancement and social progress). Its main purpose is to identify how Laureate undergraduates perform *vis-à-vis* undergraduate students from other universities in Mexico, both public and private and with different performances, recruitment and admission processes. Specifically, it aims to assess the performance of graduates in the labor market and their avenues for social mobility, both from college graduates' and their employers' perspectives.

The outcome results assessed in this report can be grouped into three categories: a) Economic Capital and Employment, which refers to various aspects of the alumni's professional career and income generation after graduation; b) Career Advancement, which measures ability to be promoted and access to managerial positions, and c) Social Progress, which captures the change in an individual's position within a power hierarchy via occupational prestige and the change in socioeconomic levels during shorter periods of time (as opposed to an intergenerational change). For those indicators with significant effects and enough data available, the analysis in this study goes further, testing for differences by gender and socioeconomic background.

This is an *ex-post* impact evaluation. Namely, it was planned and implemented years after the individuals participating in this study enrolled and graduated from college, cancelling the possibility of having baseline information available. Thus, the study relies on data collected directly from the field, including a college graduate's survey (who enrolled between 2005 and 2007), an employer's survey, and in-depth interviews to Laureate former students. The analysis is based on a quasi-experimental approach for an impact evaluation, complemented with descriptive statistics and qualitative information.

The report is organized as follows: section two states the motivation of the study; section three describes the methodology; section four provides a description of the data sources; section five shows both the main results and the limitations of the study, and section six presents the conclusions.

2. Motivation of the Study

i. Higher Education in the Mexico City Area

At the beginning of every academic year, approximately 200,000 new students join an undergraduate program in Mexico City's Metropolitan Area (MCMA). This figure represents 21% of the total new enrollments at the national level, the highest share in the country.¹⁵ A significant portion of these students attends two public universities: the *Universidad Nacional Autónoma de México* (UNAM)¹⁶ and the *Instituto Politécnico Nacional* (IPN)¹⁷. Together, these institutions contain approximately 39% of the population enrolled in a higher education program in the metropolitan area.¹⁸

UNAM is the largest university in Latin America. Currently, its total enrollment is approximately 190,000¹⁹ students (26% of the total enrollment in MCMA). The IPN, with around 100,000 students, is Mexico's second largest university, accounting for 13% of the enrollment in the area (Table 1). In terms of their socioeconomic background, enrolled students at UNAM and/or IPN are highly heterogeneous and distributed almost uniformly across the upper, middle, and lower middle social classes.²⁰ However, the public universities' capacity to provide access to higher education is limited. Only 14% of the applicants get admitted to these universities.²¹

Alternatively, the MCMA is also home to more than 180 private universities which, all combined, account for over 50% of the total undergraduate enrolled population.²² These colleges can be classified in two groups:²³ financially accessible universities and premium universities. The first group is constituted by private universities that provide higher education degrees with flexible class schedules, shorter programs, and relatively low tuition fees. The flexible class schedule scheme allows students to work full or part time, while shorter programs imply lower opportunity costs. The tuition fees at these universities vary from \$24,000 MXN (\$1,630 USD) per year at *Universidad ETAC*²⁴ to \$93,000 MXN (\$6,500 USD) per year at *Escuela Bancaria y Comercial* (EBC).²⁵ This group of universities has a market share of 37% of the higher education system.²⁶ Financially accessible private universities have an enrollment capacity that is 26% more than their total applicant pool, signifying unused system capacity.^{27,28}

By comparison, the premium, private universities charge relatively high tuition fees and most of their students are enrolled in full time programs, while a large proportion of the faculty has a post-graduate degree. The cost of

¹⁵ According to the *Asociación Nacional de Universidades e Instituciones de Educación Superior* (ANUIES) and *Instituto Nacional de Estadística, Geografía* (INEGI), Mexico City's metropolitan area also accounts for 22.8% of the total enrollment in higher education at the national level, which is 3.45 million students.

¹⁶ UNAM, (*Dirección General de Administración Escolar*, DGAE).

¹⁷ IPN, Department of Social Communication.

¹⁸ There are two other major public universities: *Universidad Autónoma Metropolitana* (UAM) and *Universidad Autónoma de la Ciudad de México*, that account for 8% of total enrollment.

¹⁹ The National Association of Universities and Higher Education Institutions (*Asociación Nacional de Universidades e Instituciones de Educación Superior*, ANUIES) 2014.

²⁰ See Appendix 5: Measuring Social Class Using AMAI.

²¹ The National Association of Universities and Higher Education Institutions (*Asociación Nacional de Universidades e Instituciones de Educación Superior*, ANUIES) 2014.

²² Ibid.

²³ This broad classification is based on Laureate's knowledge of the higher education market. Universidad La Salle, at the lower bound of premium universities, has an annual tuition fee of approximate \$8,120 USD. UVM, at the upper bound of the financially accessible universities, costs annually approximately \$6,100 USD. This classification simplifies the higher education market but proves useful as a starting point for research about returns to college education in Mexico.

²⁴ *Universidad ETAC*.

²⁵ *Escuela Bancaria y Comercial* (EBC)

²⁶ The National Association of Universities and Higher Education Institutions (*Asociación Nacional de Universidades e Instituciones de Educación Superior*, ANUIES) 2014.

²⁷ Ibid.

²⁸ Universities published its available places for enrollment each year. This 26% is the ratio of number of available seats divided by the number of received applications.

premium universities fluctuates from \$120,000 MXN (\$8,120 USD) per year for a program at *La Salle*²⁹ to \$180,000 MXN (\$12,235 USD) per year when studying at the ITESM³⁰ (although all of these universities offer grants and scholarships to a significant proportion of their students). The market share of this group of academic institutions is about 6% of the total higher education students in the MCMA.³¹ Premium institutions of higher education usually offer joint academic programs with prestigious universities in Europe and the United States, some of them have appeared in international university ranks,³² and their alumni hold high positions in the public and private sectors. Premium private universities are more selective than those in the financially accessible group, with an average rejection rate of 18%.³³

The market share for private universities in general is highly fragmented. Table 1 shows enrollment figures for the four largest universities (based on total enrollment) for each category of universities in the MCMA. None of the private institutions hold more than 3% of the market. However, there is limited data about the economic and social returns of attending a specific college vis-à-vis the alternatives. This fact suggests that, although institutions may follow different strategies to enroll new students and achieve high standards of educational quality, aspiring students do not have enough information to weigh the costs and benefits of attending any given university.

Table 1. Enrollment in the Mexico City's metropolitan area, by selected universities.

TOTAL STUDENT ENROLLMENT, BY SELECTED UNIVERSITIES, 2012-2013		Market Share
Financially Accessible Universities (excluding Laureate Universities)		
Universidad Mexicana, S.C.	17,220	2.3%
Universidad Insurgentes S.C	14,182	1.9%
Universidad ICEL	11,712	1.6%
Universidad ETAC	7,046	0.9%
Premium Universities		
Instituto Tecnológico de Estudios Superiores de Monterrey	10,856	1.4%
Universidad Iberoamericana	10,224	1.4%
Universidad La Salle A.C.	7,636	1.0%
Universidad Panamericana	4,387	0.6%
Public Universities		
Universidad Nacional Autónoma De México	190,254	25.3%
Instituto Politécnico Nacional	99,119	13.2%
Universidad Autónoma Metropolitana	50,700	6.7%
Universidad Autónoma De La Ciudad De México	12,797	1.7%
Total enrollment for the universities listed above	436,133	57.9%
Total enrollment in the MCMA	752,778	

Source: ANUIES, analysis by C230 Consultores

Furthermore, there is a vast growth potential for private universities, since overall access to higher education remains critically limited. From roughly 600,000 college applicants in the Mexico City metropolitan area each year, 69% of

²⁹ *Universidad La Salle México*.

³⁰ Monterrey Institute of Technology and Higher Education (*Instituto Tecnológico y de Estudios Superiores de Monterrey*, ITESM).

³¹ The National Association of Universities and Higher Education Institutions (Asociación Nacional de Universidades e Instituciones de Educación Superior, ANUIES) 2014

³² ITESM, ITAM and Universidad Iberoamericana have appeared in the following rankings: QS World University Rankings, The Wall Street Journal, and The Economist.

³³ The National Association of Universities and Higher Education Institutions (Asociación Nacional de Universidades e Instituciones de Educación Superior, ANUIES) 2014.

them do not get access to a college education.³⁴ This is mainly due to the fact that for most of the individuals who are not offered admission in a public university (approximately 370,000) there are not enough spots available for them in private universities (either financially accessible or premium).³⁵ It is also true that not all of the individuals who do not get access to a public university apply to a private alternative, either because they cannot afford them or do not consider them a viable option. This constitutes a market opportunity that private universities, especially those in the financially accessible group, are trying to address. Nonetheless, this is a highly competitive sector and even institutions offering grants and scholarships failed to achieve their targeted level of admission applications.³⁶

ii. The Laureate Education Program

*Laureate International Universities*³⁷ is a leading international network of institutions of higher education. The Laureate network is comprised of more than 80 universities which provide undergraduate and graduate programs to over 950,000 students around the world. These students belong to an international and academic community that spans 29 countries throughout the Americas, Europe, Africa, Asia, and Middle East. Laureate's universities offer hundreds of career-focused undergraduate, master's, and doctoral programs in fields such as architecture, art, business, culinary arts, design, education, engineering, health sciences, hospitality management, information technology, law, and medicine.

Relationships amongst this network of universities are enriched with shared curricula, faculty, degree programs, and student exchange opportunities. However, every institution in the Laureate network operates under its own unique brand, guided by local leadership, and actively involved in its community.

Over the past decade, Laureate acquired two major universities in Mexico: the *Universidad del Valle de México* (UVM) and the *Universidad Tecnológica de México* (UNITEC).³⁸ While UVM has national coverage, UNITEC's reach spans Mexico City's Metropolitan Area and nearby cities such as Toluca (in the State of México) and Leon (in the State of Guanajuato).

UVM is the largest system of private universities in Mexico, with more than 120,000 students nationwide, and more than 33,000 in the MCMA.³⁹ It offers undergraduate (both traditional and working adult) and graduate programs on 37 campuses throughout the country, as well as education programs at the high school level. UVM's higher education programs span diverse fields such as: arts and humanities, economics, business administration, engineering, health sciences, and social sciences. Also, its students have the opportunity to enroll in dual-degree programs with other academic institutions in the *Laureate International Universities* network, including *École Supérieure du Commerce Extérieur* (France), Glion Institute of Higher Education (Switzerland), *Universidad Europea de Madrid* (Spain), and Walden University (United States). The cost of studying for one year at a UVM's campus in Mexico City is roughly \$90,000 MXN (\$6,100 USD), that is, a cost located at the upper end within the category of financially accessible universities.

On the other hand, UNITEC is a financially accessible alternative that focuses on increasing access to higher education by offering affordable programs (\$2,000 USD per year, roughly one third of UVM's tuition fee) and shorter degrees (3 years, instead of 4.5). There are nearly 60,000 students enrolled nationwide throughout its 6 campuses and online

³⁴ Ibid.

³⁵ Private universities have only 15,000 places of extra-capacity.

³⁶ Only 22% of financially accessible universities had more applicants than admission offerings.

³⁷ Formerly known as Sylvan International Universities, founded in 1998 by Sylvan Learning Systems, a public company focused on educational services for students in primary and secondary education. In 2004 the company shifted focus towards post-secondary education and changed its name to Laureate Education, Inc. Later on, the company was acquired by a new investor and became a private entity in 2007.

³⁸ "Timeline." *Laureate International Universities*, accessed January 13, 2015, <http://www.laureate.net/AboutLaureate/TimeLine#timeline-4>

³⁹ For the 2012-2013 school year. Figure obtained from The National Association of Universities and Higher Education Institutions (*Asociación Nacional de Universidades e Instituciones de Educación Superior*, ANUIES)

platform,⁴⁰ with almost 38,000 students in the MCMA.⁴¹ UNITEC's students can choose from a wide selection of academic programs in fields such as: arts and design, biological medical sciences, business administration, engineering sciences, and social sciences. Business administration and dentistry are among the school's best-known and in-demand programs.⁴²

Even though UVM and UNITEC were categorized as financially accessible private universities, and have almost the same market share in the MCMA (4.4% and 4.9% respectively),⁴³ they target populations from different socioeconomic backgrounds and with different academic profiles and interests. While UVM's students generally belong to upper and middle socioeconomic classes, the majority of UNITEC's students come from middle and lower socioeconomic class households.⁴⁴ In terms of academic interests, UVM is well-known for its programs in social and administrative sciences, whereas UNITEC's more sought-after degrees come from the engineering and health sciences disciplines. Finally, the duration of the academic programs is slightly different as well. While 40% of UNITEC students completed their studies in 3 years, only 16% of UVM students graduated in the same period of time.

iii. Research Objectives

The study sought to evaluate returns to education for college graduates from Laureate universities *vis-à-vis* graduates from other universities. In order to achieve this goal, three specific objectives were established:

1. *Identify the impact of having a degree from a Laureate institution on factors related to social mobility,⁴⁵ vis-à-vis having a degree from another university.*

The underlying hypothesis behind this objective is that a Laureate education results in better professional outcomes and that investing in this type of private education delivers better chances of upward social mobility compared to other universities, recognizing that at times, the impact a Laureate education has on professional outcomes will be different for males and females.

2. *Provide an employer's perspective of the perceived market value of the Laureate alumni.*

This objective seeks to understand how employers perceive the performance, skills, and quality of work of Laureate alumni.

3. *Understand the perceptions of Laureate alumni regarding their career expectations and levels of satisfaction.*

This objective aims to study Laureate alumni's motivation to enroll in those universities and build a narrative that explains their professional expectations and perceptions about socioeconomic mobility.

⁴⁰ "UNITEC." *Laureate International Universities*, accessed January 13, 2015,

<http://www.laureate.net/OurNetwork/LatinAmerica/Mexico/UniversidadTecnologicadeMexicoUNITEC#t1>

⁴¹ For the 2012-2013 school year. Figure obtained from ANUIES

⁴² "UNITEC." *Laureate International Universities*, accessed January 13, 2015,

<http://www.laureate.net/OurNetwork/LatinAmerica/Mexico/UniversidadTecnologicadeMexicoUNITEC#t2>

⁴³ ANUIES

⁴⁴ Data obtained from C230-IFC Graduates' Survey, 2014.

⁴⁵ e.g. income, economic capital, employability, career advancement, and social progress

3. Methodology

i. The Research Questions

In order to assess whether a Laureate higher education grants its graduates greater economic and social benefits by improving their professional outcomes, the study identified a specific set of research questions. The research questions, as presented below in Table 2, were defined in accordance with the three specific objectives.

Table 2. Research questions, by objective

Objective	Research question
1. Identify the impact of having a degree from a Laureate institution on factors related to social mobility, vis-à-vis having a degree from another university.	<ul style="list-style-type: none"> ✓ Are individuals who graduated from UNITEC or UVM more likely to have better paid jobs? ✓ Do UNITEC and UVM alumni have access to higher quality jobs? ✓ Are Laureate alumni more likely to hold managerial positions or get promotions in the workplace? ✓ Do Laureate alumni advance in their careers at the same pace than graduates from other universities? ✓ Is there a difference in career advancement between men and women graduates? ✓ Are UVM and UNITEC promoting greater upward mobility in the social status of their graduates? ✓ How satisfied are Laureate alumni with the education they received at either UNITEC or UVM?
2. Provide an employer's perspective of the perceived market value of the Laureate graduates.	<ul style="list-style-type: none"> ✓ What is the perceived value the job market associates to the Laureate alumni? ✓ How does the job market perceive Laureate alumni in terms of their performance? ✓ What are the most sought-after skills in a graduate according to the job market? ✓ How do employers perceive the Laureate alumni regarding the most important skills required in the job market?
3. Understand the perception of Laureate graduates regarding their career expectations and level of satisfaction.	<ul style="list-style-type: none"> ✓ What are the main reasons that can motivate the decision of an individual to enroll in a Laureate institution? ✓ Are the career expectations of the Laureate alumni at graduation being fulfilled in their current professional life? ✓ How do Laureate alumni perceive their university?

Source: C230 Consultores

ii. Research Design

To assess the impacts of a Laureate higher education in the performance of graduates in the labor market, career advancement, and social progress (their avenues for social mobility), the research plan followed a mixed-methods approach. Therefore, every specific objective was developed based on different methodological approaches with specific data sources (Table 3). Provided that the results from the impact evaluation are the most robust, these are considered the main findings of this report. Information from employers' survey and alumni in-depth interviews contributes to develop a richer and multidimensional narrative, as well as ascertain that the statistical findings of the impact evaluation are in line with employers' and alumni's perceptions.

Table 3. Three Approaches Employed in the Research

Objective	Methodological Approach	Data Source ⁴⁶
1	Quasi-Experimental Impact Evaluation	C230-IFC Graduates' Survey
2	Quantitative Analysis and Descriptive Statistics	Employers' Survey
3	Qualitative insights from Laureate graduates	In-depth Qualitative Interviews

Source: C230 Consultores

A. First Approach: Quasi-Experimental Design

In the **first approach**, the study focused on a set of outcomes related to the graduates' income, employability, career advancement, and social progress, comparing between Laureate alumni and graduates from other universities (Table 4). The following tasks were performed:

1. Design of a questionnaire for graduates
2. Review of the UVM and UNITEC administrative information
3. Definition of the sampling frame
4. Collection of primary data through telephone, and face to face surveys to graduates (1,480 surveys after piloting a small sample)
5. Construction of the final matched sample
6. Perform statistical tests to analyze the data obtained from the survey and assess the impact of the Laureate institutions' programs

Firstly, the questionnaire was designed based on the following outcome indicators related to social mobility:

Table 4. Outcome Indicators Related to Social Mobility

Categories	Aspects	Outcome Indicators
Economic Capital and Employment	a) Employability	<ul style="list-style-type: none"> ✓ Time between graduation and first job ✓ Maximum amount of time unemployed since graduation ✓ Proportion of graduates currently employed
	b) Income and Job Quality	<ul style="list-style-type: none"> ✓ Monthly Income in Mexican Pesos (MXN) ✓ Number of benefits received from the workplace (specifically, social security, private medical insurance and year-end bonus)
Career Advancement	c) Satisfaction with Current Professional Life	<ul style="list-style-type: none"> ✓ Perceived usefulness of the major studied for professional life ✓ Satisfaction with current job
	d) Career Advancement	<ul style="list-style-type: none"> ✓ Percentage of graduates holding a managerial position in the workplace ✓ Percentage of graduates recently promoted
Social Progress	e) Changes in Socioeconomic Status	<ul style="list-style-type: none"> ✓ Proportion of graduates that have experienced positive change in the occupational prestige compared to their parents. (See Appendix 6: Prestige Based on Occupation Methodology) ✓ Proportion of graduates that have experienced positive change in the socioeconomic level before enrollment compared to current socioeconomic level (See Appendix 5: Measuring Social Class Using AMAI).

Source: C230 Consultores

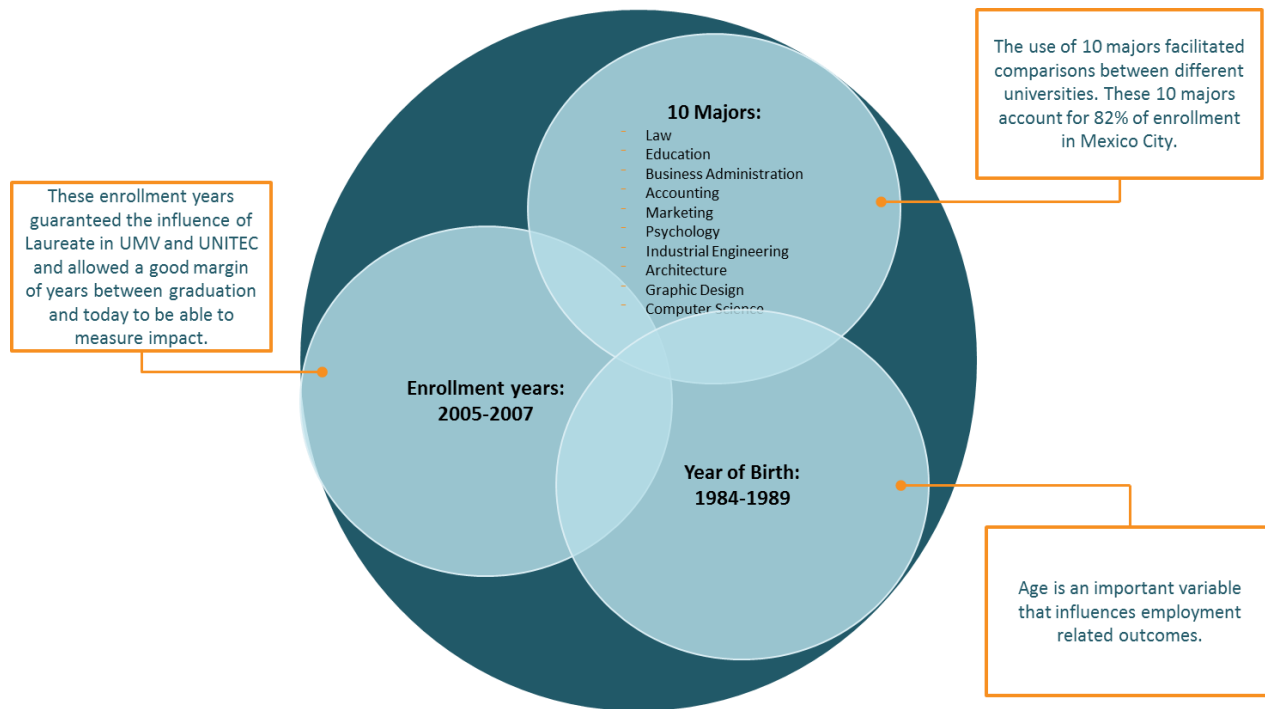
⁴⁶ C230 is grateful to the Market Research Department of Laureate-Mexico for its useful support and valuable comments during the design and implementation of the surveys.

This methodological approach relied on comparing outcomes from a treatment group (UVM and UNITEC) to a control group (other private and public universities). The treatment group included individuals who enrolled in and graduated from the traditional bachelor degrees offered by UVM and UNITEC (Figure 1).⁴⁷ More precisely, those individuals between the ages of 17 and 21 years old at the time of enrollment (during the years 2005-2007), who attended a Laureate institution located in the Mexico City Metropolitan Area. To maintain a higher level of homogeneity in the treatment group, the individuals that graduated from an executive program were not considered in this study, as these individuals usually start studying at later ages (around 25 years old or more) and, in general, might already have some work experience before their enrollment.⁴⁸ Hence, the treatment group was limited to individuals born between 1984 and 1989.

The treatment group considered students from only 10 of the most representative academic programs, which account for 82% of Laureate alumni.⁴⁹ The selected majors seemed suitable to be considered since they constitute the most demanded programs in Mexico City, and thus facilitated the comparison between different universities.⁵⁰

In terms of the year of enrollment, 2005, 2006 and 2007 seemed to be the most appropriate years for the study. On one hand, the intention was to go back as far as possible, in order to assess Laureate's alumni career development over an extended period of time (four to five years). On the other hand, there was a restriction as Laureate took control over and made important institutional changes to UNITEC and UVM during the second half of the past decade. Incidentally, 2005 is the first year in which there are sound administrative records containing alumni contact information. These enrollment years guaranteed the influence of Laureate in UVM and UNITEC, while ensuring that graduates had at least three years of experience in the job market post-graduation.

Figure 1. Selection criteria for the evaluation sample



Source: C230 Consultores

⁴⁷ Sample size calculations are shown in Appendix 2. Quasi-Experimental Impact Evaluation (based on Graduates' Survey) part A.

⁴⁸ Online programs' graduates were also excluded from the study due to the low probability of finding a similar individual from another university (counterfactual).

⁴⁹ See Appendix 1. Enrollment per Major at UVM and UNITEC in Mexico City Metropolitan Area During 2013.

⁵⁰ Choosing only enrollment as the treatment would increase the number of treated individuals and might facilitate the calculation of elasticity of enrollment into Laureate. Nevertheless, it would complicate the interpretation of the results, increase heterogeneity in the sample, and add marginal information to the study (an important increase in the number of interviews would be necessary to calculate treatment elasticity).

a. Building a Valid Control Group

The quasi-experimental control group relied on finding individuals that graduated from other public and private universities, who are the most comparable to the treatment group based on pretreatment observable characteristics. Two different comparison groups were proposed:

1. A group of individuals who graduated from other (non-Laureate) universities, which includes both public and private institutions.
2. A group of individuals who graduated from a (non-Laureate) private university only, including financially accessible and premium universities.

This categorization was constructed taking into consideration the importance of having a sample that represented the diverse types of academic institutions operating in the MCMA. In particular, the group of financially accessible private universities is somehow comparable to UVM or UNITEC in terms of factors like cost of tuition, offered majors, enrollment, campus infrastructure, prestige of graduates, and students' socioeconomic status. Nonetheless, private premium universities present some characteristics similar to UVM and UNITEC's, such as offered majors, campus infrastructure, and student's socioeconomic status and, as a result, were included in the control group.

b. The Matching Strategy

The impact evaluation relied on a matching procedure. The main purpose was to have individuals in the treatment and control groups with similar conditions previous to college enrollment. The premise was that if the initial conditions were as similar as possible, the difference in the outcome variables could be explained by receiving the treatment (namely, a Laureate degree).

Any matching process always assumes that all relevant variables, or covariates, can be observed and account for all pre-treatment differences across the treatment and control groups. Moreover, such covariates should not be affected by the treatment. In this case, the pre-treatment observable variables that meet these conditions are: gender, age, enrollment year, household socioeconomic status, parents' educational background, employment status before a student's enrollment, and high school's type (Table 5).

Table 5. Matching Covariates

Variables	Description
<i>Gender</i>	Male or Female
<i>Age</i>	Individuals born between 1984 and 1989
<i>Year of Enrollment</i>	Enrolled in years 2005, 2006 or 2007
<i>Education of Father</i>	The highest educational level attained by the graduate's father*
<i>Education of Mother</i>	The highest educational level attained by the graduate's mother*
<i>Socioeconomic Status</i>	The pre-enrollment socioeconomic status of household measured by AMAI (see Appendix 5: Measuring Social Class Using AMAI)
<i>Type of High-School</i>	Attended public or private high-school before enrollment at university
<i>Employment Status</i>	Whether the graduate had a job before university enrollment

The impact evaluation was implemented by conducting a one-to-one matching with replacement following a genetic search algorithm.⁵¹ The Genetic Matching Algorithm searches amongst a range of distance metrics to find the particular measure that optimizes post-matching covariate balance across the treatment and control groups. Each

⁵¹ Performed by the Matching package in the R software.

potential distance metric considered corresponds to a particular assignment of weights for all matching variables. The algorithm weights each variable according to its relative importance and iterates until achieving the best overall balance.^{52, 53}

The matching strategy achieved a successful balance across the treatment and control groups. Some matching variables presented significant disparities in the pre-matched sample. Such was the case for variables such as socioeconomic levels, parents' education, and high school background, a clear reminder that a simple comparison cannot be made for graduates of different universities. Table 6 presents descriptive statistics for the matching variables (prior to the treatment) before and after running the Genetic Matching Algorithm, showing that the differences disappear, although at the cost of losing observations in the process.⁵⁴

Table 6. Pre and Post Matching Comparison of Descriptive Statistics of Matching Covariates

	Pre-Matching		Post-Matching			
Matching Variables	Treatment	Control	Treatment (matched observations)	Control (both public and private universities)	Treatment (matched observations)	Control (only private Universities)
Age						
Observations	637	843	307	307	153	153
Mean	27.05	27.31	26.97	26.97	26.78	26.73
Standard deviation	1.44	1.76	1.40	1.43	1.38	1.50
Difference between means	0.26		0.00		-0.06	
ttest	t(1478)=3.0212	p=0.0026	t(612)=-0.0286	p=0.9772	t(304)=-0.3567	p=0.7215
Year of Enrollment						
Observations	637	843	307	307	153	153
Mean	2006.03	2006.09	2006.06	2006.06	2006.16	2006.16
Standard deviation	0.76	0.86	0.78	0.78	0.71	0.71
Difference between means	0.06		0.00		0.00	
ttest	t(1478)=1.2860	p=0.1987	t(612)=0	p=1	t(304)=-0.0000	p=1.0000
Max Education Level of Father*						
Observations	628	835	307	307	153	153
Mean	3.83	2.43	4.17	4.18	4.12	4.09
Standard deviation	2.07	1.96	1.38	1.41	1.32	1.34
Difference between means	-1.40		0.01		-0.03	
ttest	t(1478)=-12.4295	p=0.0000	t(612)=0.0580	p=0.9538	t(304)=-0.1718	p=0.8637
Max Education Level of Mother*						
Observations	609	812	307	307	153	153
Mean	4.51	3.02	3.77	3.81	3.79	3.85
Standard deviation	2.20	2.25	1.31	1.26	1.24	1.27
Difference between means	-1.48		0.04		0.06	
ttest	t(1478)=-13.1780	p=0.0000	t(612)=0.3456	p=0.7298	t(304)=0.4091	p=0.6828
Household's						

⁵² Diamond, Alexis, y Jasjeet S. Sekhon. "Genetic Matching for Estimating Causal Effects: A General Multivariate Matching Method for Achieving Balance in Observational Studies." Review of Economics and Statistics, 2012.

Sekhon, Jasjeet S. "Multivariate and Propensity Score Matching." Journal of Statistical Software, 2011.

⁵³ A general description of the Genetic Matching method can be found in Diamond and Sekhon (2012). <http://sekhon.berkeley.edu/papers/GenMatch.pdf>

⁵⁴ As an alternative, Coarsened Exact Match (CEM) was proposed and the research team compared some of the outcomes with those obtained from Genetic Caliper Matching. The results are similar, and move in the same direction. However, CEM results have a lower magnitude, bigger standard errors, and the covariate balance between the treatment and control group is not as precise as the one achieved by the Genetic Caliper algorithm, although the number of matched observations was larger.

	Pre-Matching		Post-Matching			
Matching Variables	Treatment	Control	Treatment (matched observations)	Control (both public and private universities)	Treatment (matched observations)	Control (only private Universities)
Socioeconomic Level**						
Observations	563	814	307	307	153	153
Mean	168.67	139.68	161.68	160.47	159.55	159.89
Standard deviation	41.84	41.00	37.30	37.12	36.41	35.26
Difference in means	-28.99		-1.22		0.34	
ttest	t(1478)=-12.7906	p=0.0000	t(612)=-0.4056	p=0.0.6851	t(304)=0.0829	p=0.9340
Gender						
Observations	637	843	307	307	153	153
Male	44.9%	53.4%	45.0%	45.0%	41.8%	41.8%
Female	55.1%	46.6%	55.0%	55.0%	58.2%	58.2%
prtest	z=3.2317	p=0.0012	z=0	p=1.0000	z=0	p=1.0000
Type of High-School						
Observations	635	842	307	307	153	153
Public	27.4%	79.7%	36.8%	36.8%	43.8%	43.8%
Private	72.6%	20.3%	63.2%	63.2%	56.2%	56.2%
prtest	z=20.1077	p=0.0000	z=0	p=1.0000	z=0	p=1.0000
Employment Status						
Observations	637	843	307	307	153	153
Employed	25.9%	36.2%	22.8%	22.8%	17.6%	17.6%
Unemployed	74.1%	63.8%	77.2%	77.2%	82.4%	82.4%
prtest	z=4.2053	p=0.0000	z=0	p=1.0000	z=0	p=1.0000

* Max level of education of mother and father classification is:

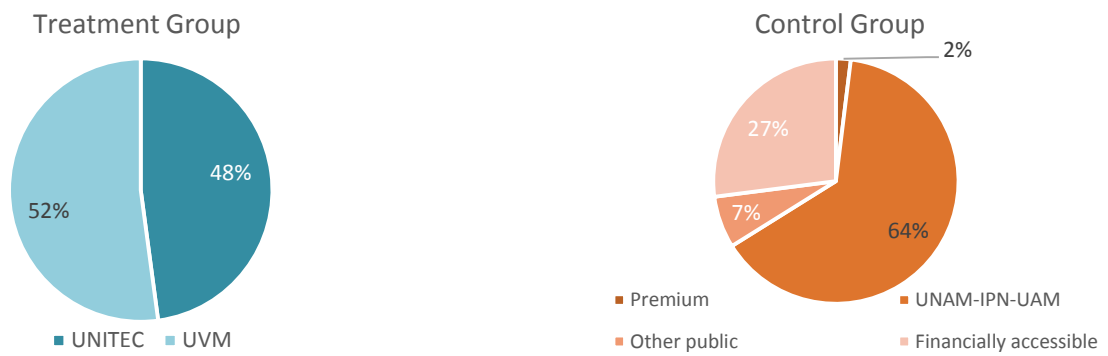
0=Without studies, 1=Primary School, 2=High School, 3=Technical studies, 4=High School, 5=College studies, 6=Bachelor's degree, 7=Graduate studies, 8=Master's degree, 9=PhD

** AMAI Socioeconomic levels have a range between 5 and 355 points. (See Appendix 5: Measuring Social Class Using AMAI)

Source: C230 Consultores

The distribution of the universities represented in the matched control group broadly corresponds with the entire sample's composition. The majority of the surveyed alumni attended either UNAM or IPN (64%), followed by almost a third of them who attended a financially accessible university (27%). There are alumni from other public universities (7%), and from premium private universities (2%).

Figure 2. Post-Matching Distribution of Universities in the Treatment and Control Groups⁵⁵



Source: C230-IFC Graduates' survey 2014.

⁵⁵ The treatment and control group matching was done utilizing the outcome variable "current status of employment," therefore there were no missing values for said variable.

Missing Observations

Missing observations in the outcome variables are a concern. They can potentially introduce a bias to the impact estimate if the missing data is correlated to unobserved factors. In other words, if missing values differ systematically between treatment and control groups, the impact estimate may be due to pre-treatment unobserved differences correlated to non-response (missing values), rather than due to a post-treatment effect. Appendix 3: presents a table with descriptive statistics.

The most susceptible outcomes to non-response bias, in this study, are “employment benefits” and “income.” The missing observations constitute more than 30% of the observations for the matched sample. If it is the case that people with lower quality of employment are less prone to provide information, then there is an upward bias, overestimating the impact for the treatment group. The “percentage of recently promoted” and “satisfaction with current job” outcomes are also compromised, although to a lesser degree, having less than 20% observations missing.

Other variables have more observations missing in the treatment group than in the control group, but they account for less than 8% of each sample.⁵⁶

This issue has been addressed with a methodology that fills the missing data with plausible values: Multiple Imputation. Our research follows a methodology proposed in King et al,⁵⁷ implemented with the software Amelia II.⁵⁸ In particular, five data sets were generated, with different plausible values, to account for uncertainty in the imputation process. The matching algorithm was implemented for each of the data sets, and then combined into one estimator for every outcome variable. Finally, those estimators were compared to those produced without correcting for missing observations. Section 5 errs on the side of caution, presenting the estimators for the outcomes that are consistent in both approaches.

⁵⁶ Such is the case of percentage of currently employed, maximum period in unemployment, time looking for first job and percentage in management positions. However, there are robust variables with low percentages of missing observations and not different across control and treatment groups; which are: positive change in socio economic index and positive change in intergenerational prestige based on occupation.

⁵⁷ King, Gary, James Honaker, Anne Joseph, and Kenneth Scheve. "Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation." *American Political Science Review* 95, 2001: 49-69.

⁵⁸ This software is free and available to the public at <http://gking.harvard.edu/amelia>

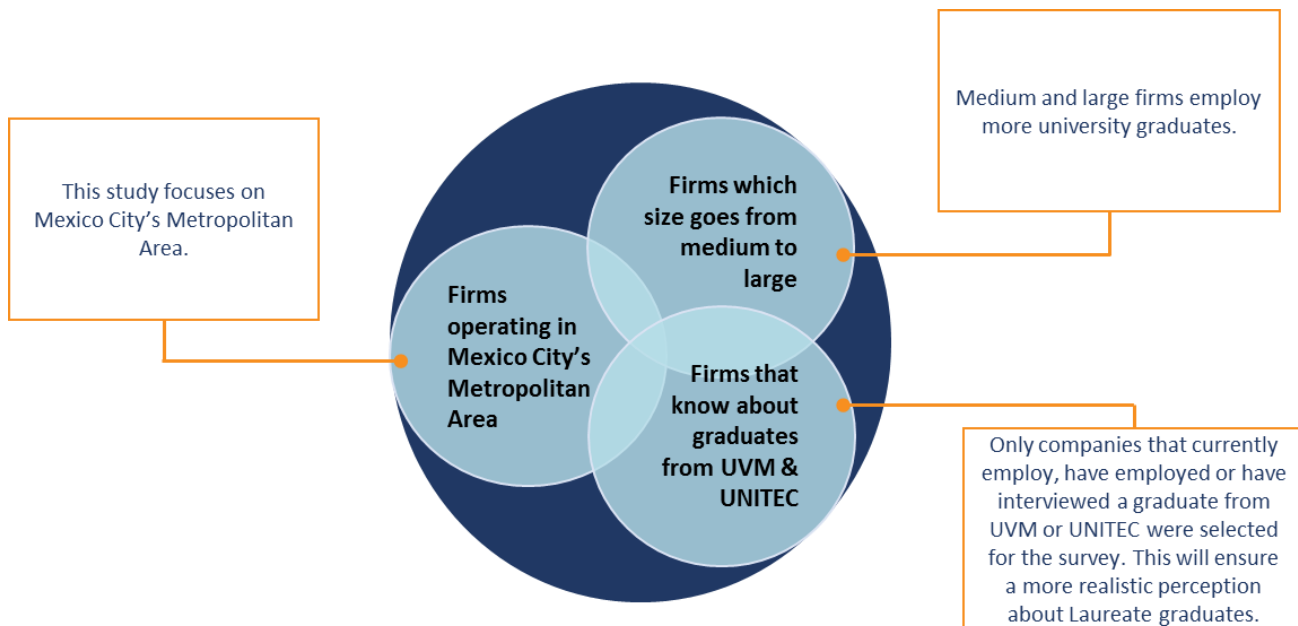
B. Second Approach: Employers' Perceptions About Graduates Performance and Market Value

The Employers' Survey served as a complement to the impact analysis done with the main survey (Graduates' Survey). The main idea of this approach was to understand employers' perceptions regarding the performance and market value of Laureate alumni, compared to graduates from other universities. The tasks performed in this approach included:

1. Design of a questionnaire for employers
2. Review of the Laureate's databases for information regarding the main employers
3. Definition of the sampling frame using the National Statistics Directory of Economic Units (DENUE), and information from Laureate's databases
4. Collection of primary data through 400 MCMA employers' telephone surveys (after piloting on a small sample)
5. Analysis of data obtained from the surveys, in order to understand the perceived market value of Laureate alumni according to the employers

The filters (during the construction of the sample frame) to select employers were the following: 1) firms located in the MCMA, because of the geographical scope of the study; 2) firms that might know about graduates from either UVM or UNITEC, to express more realistic perceptions about how they compare them to graduates from other universities, and 3) firms from medium to large sizes, in order to increase the likelihood of surveying companies that have experience working with university graduates. The filter criteria are shown in Figure 3.

Figure 3. Filter Criteria for the Employers' Survey



Source: C230 Consultores

The aspects that were analyzed in this approach in order to understand the performance, quality, and market value of graduates from Laureate in the labor market are presented in Table 7.

Table 7. Variables Used in the Second Approach

Aspects of Interest	Description
<i>Employability</i>	How often do Laureate alumni obtain the positions they have applied for in the job market?
<i>Income and Job Quality</i>	Would UVM's or UNITEC's graduates receive a higher or lower wage than graduates from other universities in the job market?
<i>Satisfaction with Professional Performance</i>	How do employers rate the performance of Laureate alumni in the workplace, vis-a vis their peers?
<i>Satisfaction with the Academic Profile of Employees</i>	How satisfied are the employers with the professional and academic skills of the Laureate alumni?
<i>Career Advancement</i>	How much time would it take a Laureate graduate to obtain a job promotion vis-a vis their peers? Do Laureate alumni possess the skills most valued in the job market?
<i>Fulfilment of Career Expectations</i>	How well-prepared are Laureate alumni to perform the activities they are called to in the workplace?

Source: C230 Consultores.

C. Third Approach: Qualitative Perception of Laureate Graduates

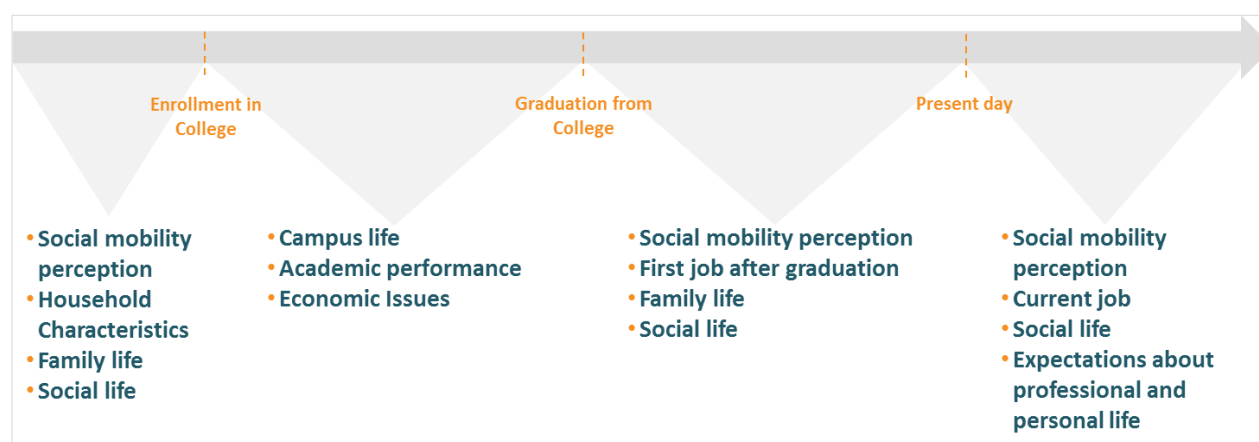
The evaluation performed a series of in-depth interviews to a selected sample of Laureate alumni. The objective of this approach was to gather more insights on the graduates' personal achievements, fulfillment of expectations, and perceptions regarding social mobility-related aspects.

In-depth interviews are useful to understand behaviors or to contextualize other data. For example, qualitative interviews can help to put results assessed through a quantitative setting into context, offering a more complete picture of what is happening and why. This approach was also important to check for possible survey response bias, specifically with the interpretation and validation of the direction of the quantitative results, as well as to clarify some hypothesis from the impact evaluation.

The first step was to develop a guide containing all the possible topics to be discussed during the interviews. The second step consisted in carrying out 20 in-depth interviews (two hours long), focused on perceptions about the professional and personal life of UVM and UNITEC alumni (with social mobility as a central topic).

The qualitative analysis was structured around three key moments in the consolidation of a graduate's professional life: the construction of the idea of the college experience and its influence in the conformation of a life plan, the complete college experience, and finally, the insertion into the job market and its impact on the professional life of the graduate. The main topics of interest for each of these three moments are listed in Figure 4.

Figure 4. Variables Used in the Third Approach



Source: C230 Consultores

4. Data Sources

i. C230-IFC Graduates' Survey

For the first approach (quasi-experimental design), it was necessary to gather information about pre-treatment observable characteristics (matching variables), and also post-treatment data (outcome variables), by implementing a survey. The study relied on the Laureate alumni administrative databases in order to contact graduates for the treatment group. These Laureate alumni databases included only individuals who had graduated from either UVM or UNITEC between years of 2006 and 2012.

To contact graduates for the control group (other universities), the study employed two sources. 1) A market research database (obtained from a marketing firm) that contained contact information as well as the filter variables to match the treatment group (Table 8). The database was already a selected sample of individuals that passed the filter variables; however, the telephone survey was applied only to those individuals that passed a second, over-the-phone filter. 2) On-field exploration of areas with high job density⁵⁹ to complete the number of observations required for the control sample. Randomly selected individuals were surveyed face-to-face at many commercial and industrial areas in MCMA. Candidates were selected based on the following criteria (filter variables).

Table 8. Filter Variables

Variables	Description
<i>Age</i>	Based on the year of birth: 1984-1989
<i>College Graduate</i>	Graduated from college before 2012
<i>Year of Enrollment</i>	Either 2005, 2006 or 2007

Source: C230 Consultores

The low response rate observed at the pilot stage generated the necessity of a very large sample size.⁶⁰ As expected, data collection was the most challenging step of the evaluation. Contacting working graduates presents many obstacles due to the length of the working day in Mexico City and the difficulty in obtaining information about income and expenditure. The call center (telephone surveys) was open 16 hours a day 7 days a week for 6 weeks in order to call approximately 10,000 graduates, and obtain the required number of surveys.⁶¹ The average length of the survey was 16 minutes and the successful contact rate at the call center was 8.6%.⁶² The original data collection plan included only telephone surveys. The low successful contact rate required the evaluators to plan for an on-field exploration to obtain the sample size required for the matching procedures. Face-to-face surveys come with methodological caveats⁶³ but made this evaluation possible. Both the telephone and the face-to-face survey were implemented during October and November of 2014. Table 9 below shows the number of surveys obtained from each source of data as well as the sample they belong to. For the control group, most of the surveys came from the face-to-face (on-field) channel.

⁵⁹ Jobs density is defined as the number of jobs in an area divided by the resident population aged 16-64 in that area. For example, a job density of 1.0 would mean that there is one job for every resident aged 16-64.

⁶⁰ Roughly 11% of the called individuals accepted the survey.

⁶¹ More than 4,000 from UVM, around 3,000 from UNITEC and 3,200 from the market research database.

⁶² Successful contact rate is calculated as the ratio of effective surveys divided by the number of called graduates in the database. The successful contact rate was 8.7% for the UVM database, 9.5 for UNITEC's and 7.6% for the market research database.

⁶³ Face-to-face surveys were implemented in areas with high job density which produced a sample more likely to be employed. Thus, study may be producing an underestimation of employability impacts.

Table 9. Effective Surveys from Data Source and by Sample

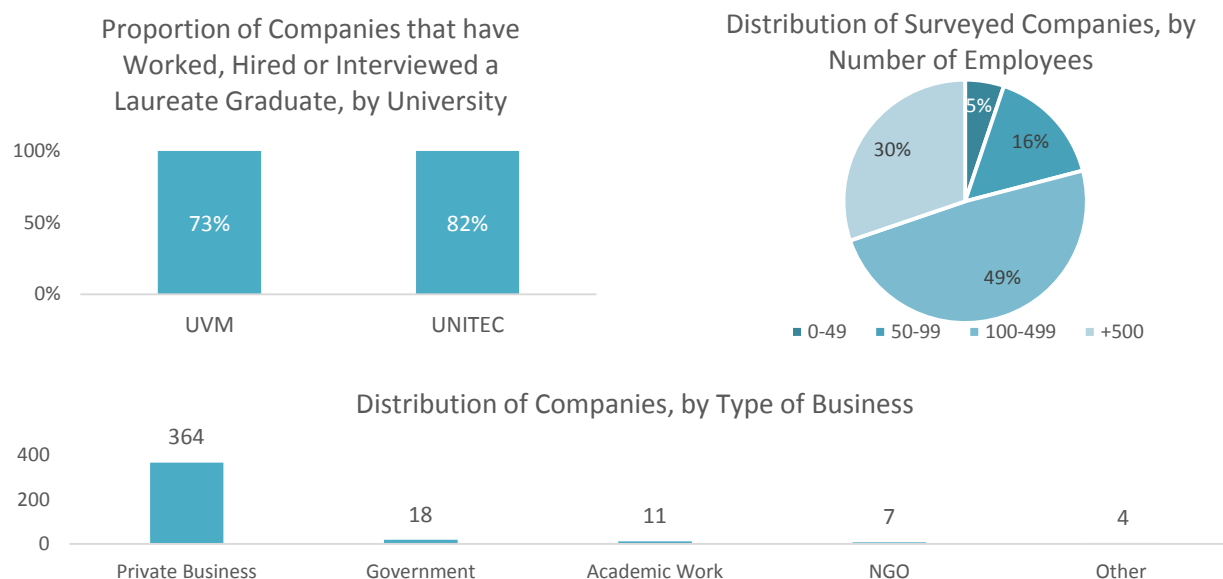
Database	Treatment	Control	Total Sample
UVM Alumni	357		357
UNITEC Alumni	280		280
Market Research Dataset		243	243
On-Field		600	600
Total			1,480

Source: C230-IFC Graduates' survey 2014.

ii. Employers' Survey

For the second approach (Employers' Survey), 400 surveys were conducted. In most of the cases, an appointment was necessary in order to contact the human resources officer responsible of hiring and evaluating employees. The survey was carried out over four weeks during October and November of 2014. The final composition of the employers' survey sample is shown in Figure 5.

Figure 5. Composition of the Employers' Survey Sample



Source: C230-IFC Employers' survey 2014.

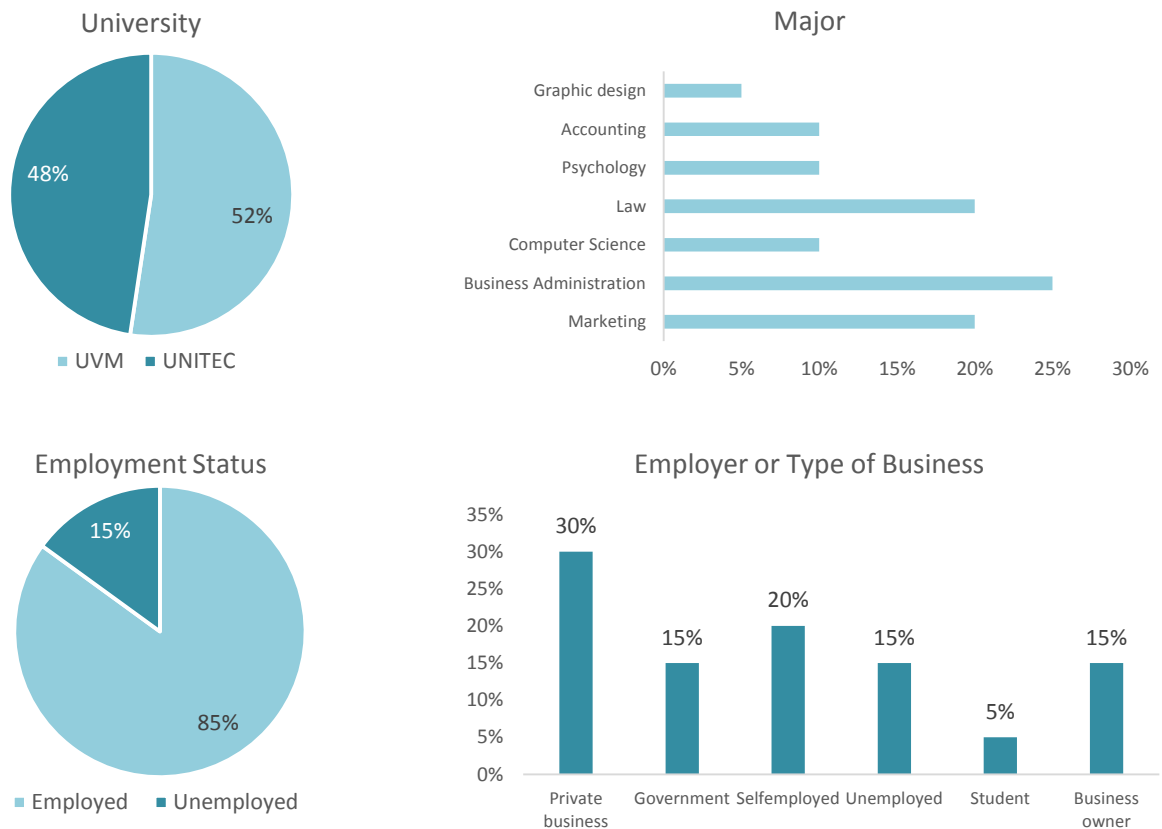
iii. In-Depth Qualitative Interviews

For the third approach (in-depth qualitative interviews to graduates), 20 graduates (10 from UVM and 10 from UNITEC) were selected from the 637 effective quantitative surveys in the treatment group. The selection of profiles sought purposely (not randomly) to balance the different experiences while studying at these universities by including stories of professional failures and successes, as well as aspects such as: social mobility, gender inequality, international experience, expectations about future, among others.

The 20 in-depth qualitative interviews were completed during 3 weeks of work between October and November 2014.

Figure 6 presents the composition of the sample used for the in-depth interviews. The sample had the same proportion of men and women, and other variables of interest were: university, major, employment status at the time of the interview, and type of business or employer. This composition guaranteed a diversity of profiles and experiences.

Figure 6. Composition of the Sample for the In-Depth Interviews, by Variable



Source: C230 Consultores.

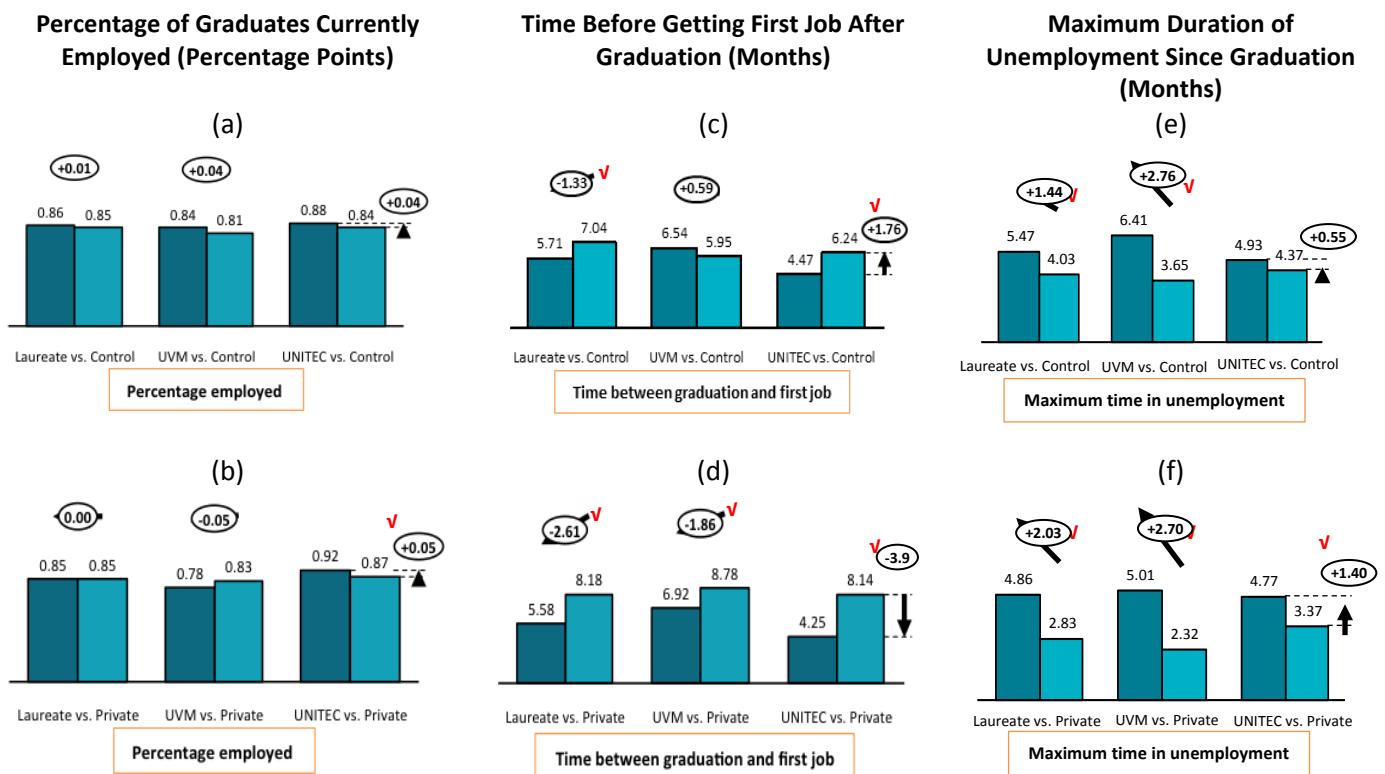
5. Findings⁶⁴

i. Employability (Access to Jobs and Unemployment)

UNITEC alumni have a higher employment rate (92%) compared to graduates from other private universities (87%). This is a positive difference of 5 percentage points.⁶⁵ In contrast, UVM does not show an employment rate different from both of the control groups (Figure 7, graphs a and b). **Laureate alumni found their first job more quickly after graduation than their counterparts from other private and public universities.** The evaluation found that Laureate graduates spent, on average, 1.3 months less to obtain their first job after graduation than the entire control group (5.7 months vs 7 months, respectively), and when the control group is restricted to only private universities, the magnitude of the effect is twofold (2.6 less months to find the first job). The results are more favorable for UNITEC; nonetheless, UVM shows a consistent impact when compared to other private universities (Figure 7, graphs c and d).

However, Laureate alumni have remained unemployed for longer periods of time since their graduation. On average, Laureate alumni have experienced periods of unemployment that are 36% longer than graduates from other universities since their graduation. On average, the maximum amount of consecutive time spent unemployed was 5.4 months for Laureate alumni and 4 months for the entire control group. The negative impact is greater for UVM; its graduates had unemployment periods 2.8 months longer than their counterparts (a 76% difference). When comparing only against the private universities, the results are consistent (see Figure 7, graphs e and f).

Figure 7. Impacts and Means of Outcome Variables Related to Employability, by Types of Comparison



Note: v denotes at least a 95% level of statistical significance.

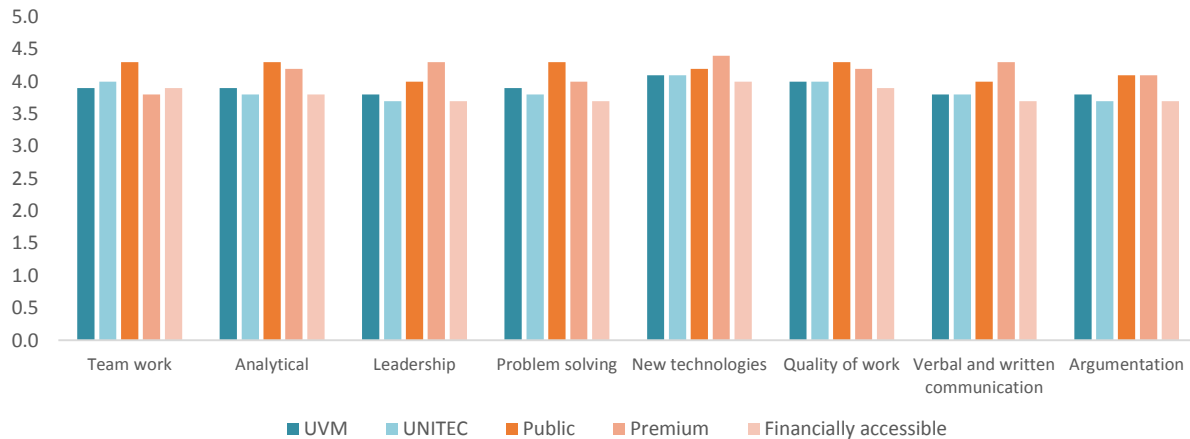
Source: C230-IFC Graduates' survey 2014.

⁶⁴ Results presented in this section were estimated using the standard approach (not correcting for missing observations), except for the case of income variable. Appendix 4 shows a table comparing outcomes with those estimated with multiple imputations. Unless explicitly noted, results are generally consistent.

⁶⁵ Difference (%) = $(Y_{\text{treated}} - Y_{\text{control}}) / Y_{\text{control}}$

The surveyed employers perceive that Laureate alumni have competitive skills compared to graduates from other universities. UNITEC and UVM alumni were graded with high scores consistently (4 out of 5 and above) in every skill considered important by the employers. However, there are some aspects that should be strengthened, as graduates from public and premium universities outperformed them in verbal and written communication and leadership skills. Laureate alumni seem to be relatively strong regarding new technologies and team work and outperformed financially accessible universities in every field (see Figure 8).

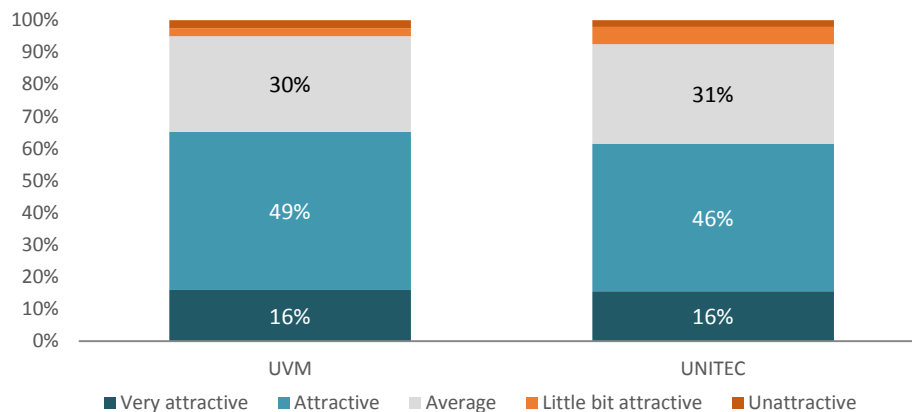
Figure 8. Employers' Evaluation to Graduates' Skills, Scores by Group of Universities



Source: C230-IFC Employers' survey 2014.

The majority of employers find the Laureate alumni's profile either attractive or very attractive. Employers find 65% of UVM alumni and 62% of UNITEC alumni in the range of attractive to very attractive (see Figure 9).

Figure 9. Laureate Alumni's Level of Profile Attractiveness to Employers, by Laureate Institution



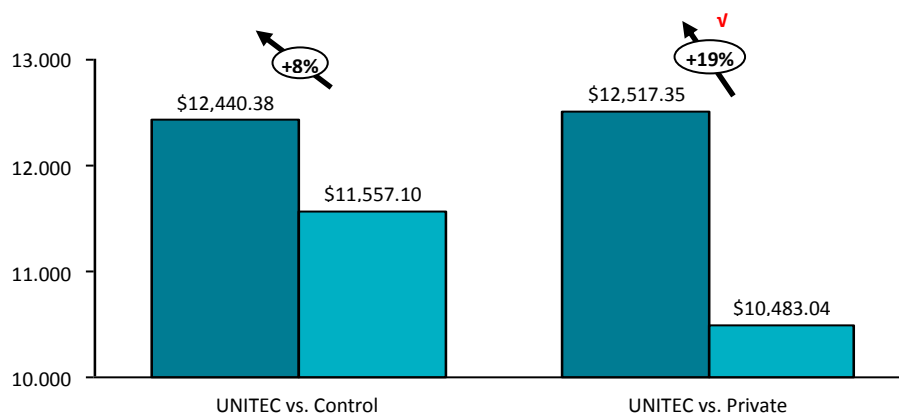
Source: C230-IFC Employers' survey 2014.

During in-depth interviews, both UNITEC and UVM alumni agreed that at school they developed valuable tools to enter the job market. However, some of them expressed concerns regarding how competitive they are when they are compared to graduates from other universities. It seemed to them that both UVM and UNITEC are perceived to be at an intermediate level of academic preparation during college.

I make good money. This allowed me to move out of my parent's house for a while [...] I have vacation days and social security.
UVM alumnus

UNITEC alumni earn on average \$2,034 MXN (\$134 USD) more than their peers in other private universities, a 19% significant difference. No effects were found when making the comparison against the larger control group (see Figure 10).⁶⁶

Figure 10. Impacts and Means of Income (MXN) for UNITEC, by Types of Comparison

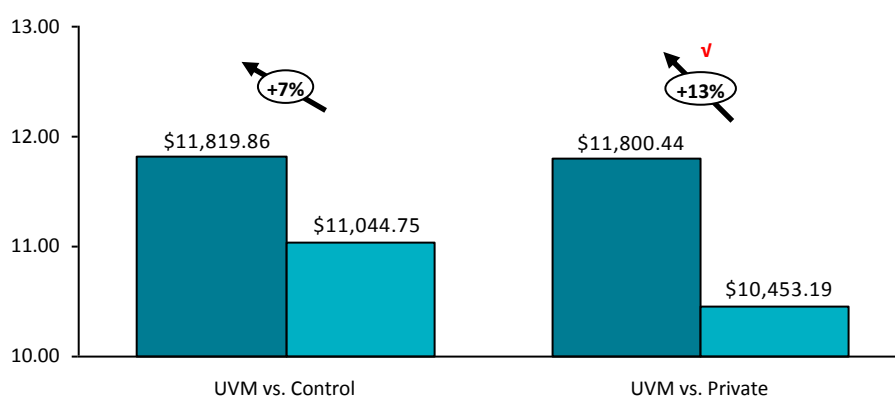


Note: ✓ denotes at least a 95% level of statistical significance.

Source: C230-IFC Graduates' survey 2014.

UVM's results are consistent. The impact on income is around 13% when comparing to private universities and non-significant compared to private and public universities together (see Figure 11).

Figure 11. Impacts and Means of Income (MXN) for UVM, by Types of Comparison



Note: ✓ denotes at least a 95% level of statistical significance.

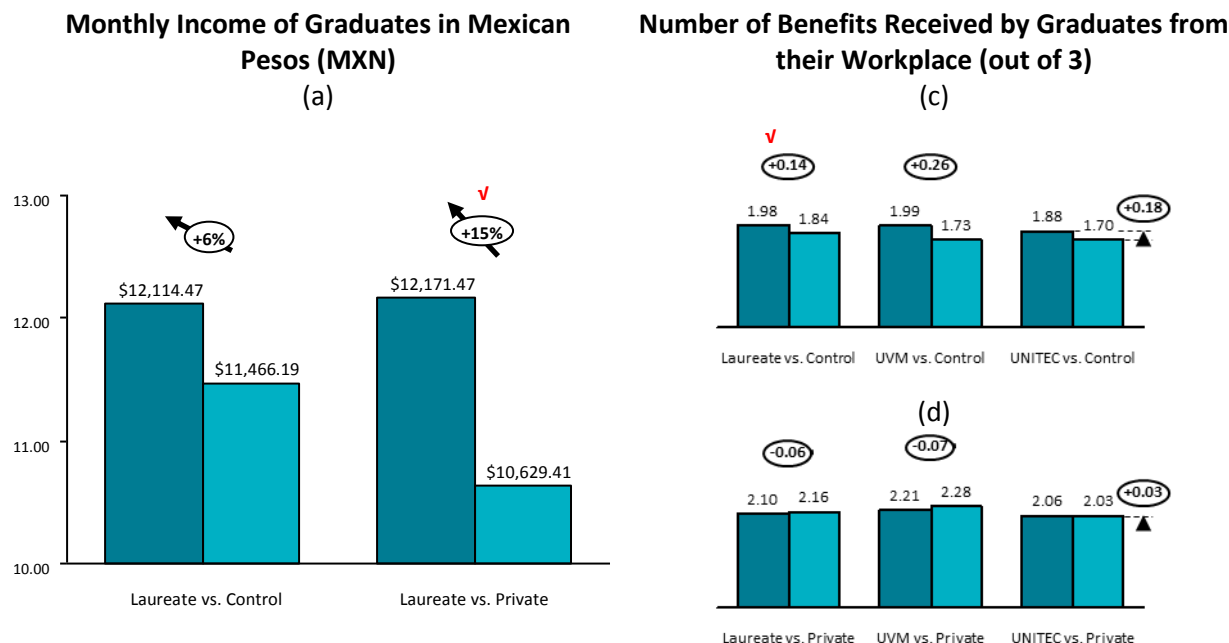
Source: C230-IFC Graduates' survey 2014.

More generally, on average Laureate alumni earn \$1,542.06 MXN (\$101 USD) more than graduates from other private universities (a 15% difference) (see Figure 12, graph a). Regarding job quality, the number of employment benefits offered to Laureate alumni (1.98 out of 3) is higher than the control group (1.84), a six percent difference.

⁶⁶ Due to the high frequency of missing observations, impact for the income variable was calculated using a multiple imputation tool proposed in King et al (2001) and implemented with the software Amelia II.

But when these results are contrasted with those from Multiple Imputation, all of these outcomes are deemed non-significant.

Figure 12. Impacts and Means of Outcome Variables Related to Income and Employment Benefits, by Types of Comparison



Note: ▼ denotes at least a 95% level of statistical significance.

Source: C230-IFC Graduates' survey 2014.

According to the surveyed employers, it is feasible for a recent Laureate graduate to attain a higher than average level of compensation. While the market is willing to pay an average monthly salary of \$6,427 MXN (\$423 USD) to recent college graduates, the employers expressed willingness to pay a monthly salary of \$6,821 MXN (\$449 USD) to a UVM graduate, and \$7,124 MXN (\$469 USD) to a UNITEC graduate (6% and 11% more, respectively).

The in-depth qualitative interviews revealed that a substantial portion of Laureate alumni had started working while they were still studying. By entering the job market before completing their studies, they were more likely to receive lower wage compensations initially, but also more likely to obtain substantial wage raises during their career.

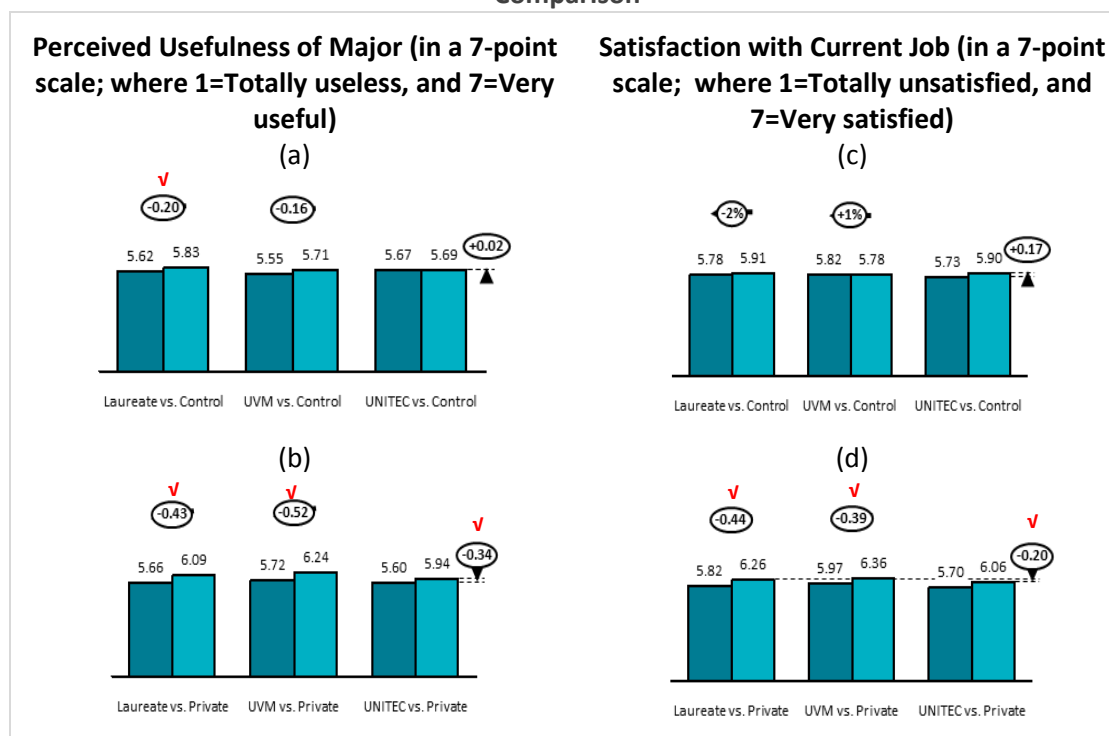
I'm financially independent. My father and I support our household.
UNITEC alumnus

iii. Satisfaction with Current Professional Life

There are important challenges concerning professional success and career satisfaction for Laureate alumni. Firstly, Laureate alumni regard their undergraduate studies as less useful than graduates from other universities. In general, Laureate alumni believe their major is less useful for professional life, from a 1-7 point scale (where 7 is the highest level of satisfaction), the average score is 0.20 points lower (a 4% lower valuation) than graduates from other control group universities (see Figure 13, graphs a and b). When the control group is restricted to only private universities, the difference is twofold for the Laureate alumni in general. Results for both for UVM and UNITEC separately are consistent.

Secondly, Laureate alumni are less satisfied with their current jobs than their peers in other private universities. The average score in terms of current job satisfaction is 5.82 points for Laureate alumni and 6.26 points for the control group. This is a 7% lower valuation for current job satisfaction, a statistically significant difference. This is also the case when UNITEC and UVM are compared (either separately or jointly) to other private universities (see Figure 13, graphs c and d). Nonetheless, these results are not significant when Multiple Imputation is used to correct for missing data. When impact estimates are not robust, such as in this case, results have to be interpreted conservatively.

Figure 13. Impacts and Means of Outcome Variables Related to Satisfaction with Professional Life, by Types of Comparison



Note: ✓ denotes at least a 95% level of statistical significance.

Source: C230-IFC Graduates' survey 2014.

However, some graduates identify positive achievements in their professional or personal life. During in-depth interviews they mentioned having opened their own businesses or organizations, having moved out of their parents' house, having studied for a higher degree, amongst others. In particular, graduates who have started their own business or organization perceived their achievements to be like *dreams come true*. Those graduates who could not clearly identify big personal achievements in their past generally have an optimistic view of their future.

[UNITEC for me] plays an important role. It gave me the tools to professionalize my business, including doing budgets, knowing how important our image is, and being on time with our deliveries.

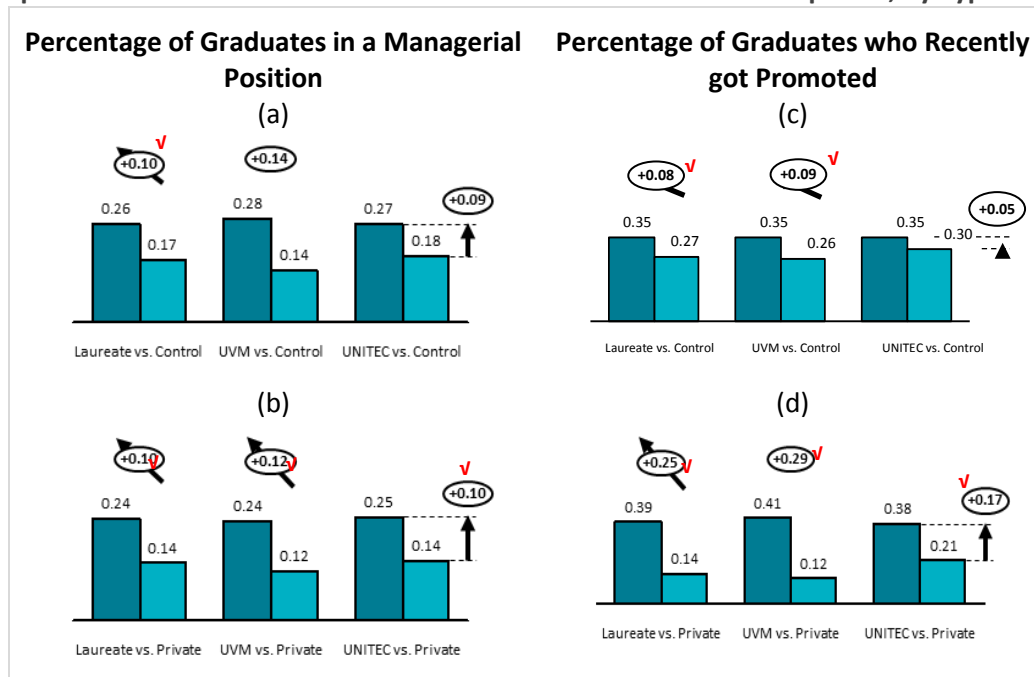
UNITEC alumnus

iv. Career Advancement (Executive Positions and Promotions)

A higher percentage of Laureate graduates are currently holding managerial positions, *vis-à-vis* the general control group (26% vs 17%, respectively). This is particularly relevant, since holding a managerial position signifies career advancement and leadership. When compared only to other private universities, the impact of a Laureate education is relatively higher and statistically significant. Results for UVM and UNITEC separately are consistent (see Figure 14, graphs a and b).

Also, more Laureate graduates have been recently promoted in the workplace. While 35% of the Laureate alumni have been promoted in their current job, the same is true for only 27% of the control group. This is a 29% significant difference (see Figure 14, graphs c and d). When compared to other private universities, all of the differences are larger: for Laureate alumni in general, 1.7 times higher; for UVM alumni, 2.4 times higher; and for UNITEC alumni 79% higher.

Figure 14. Impacts and Means of Outcome Variables Related to Career Development, by Types of Comparison



Note: ✓ denotes at least a 95% level of statistical significance.

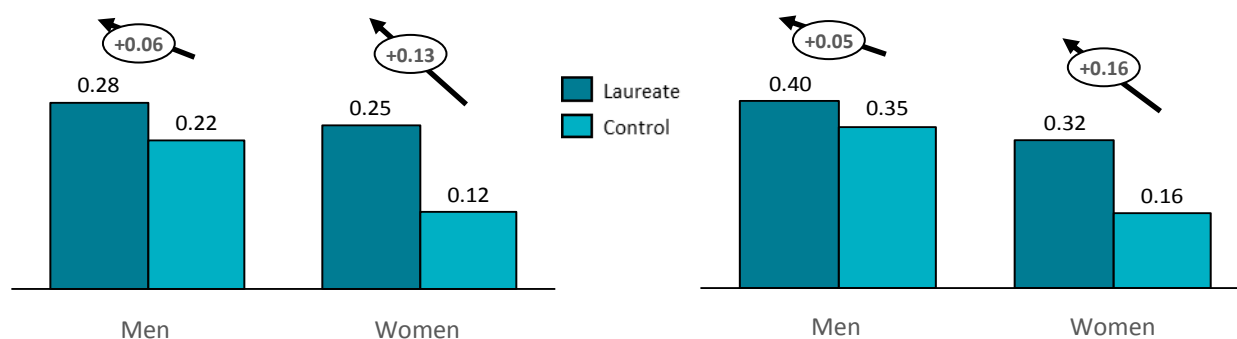
Source: C230-IFC Graduates' survey 2014.

The outcomes for career advancement are especially favorable for women, for both UVM and UNITEC. While the average effect for the proportion of men holding a management position is 5 percentage points (a 25% difference), the effect for women is 13 points (more than 100% difference). Regarding the proportion of alumni that recently received a promotion, the effect is 5 percentage points for men (a 15% difference) and 15 percentage points for women (a 95% difference).

Figure 15. Laureate vs Control Impacts of Outcome Variables Related to Career Development, by Genre

Percentage of Graduates in a Managerial Position

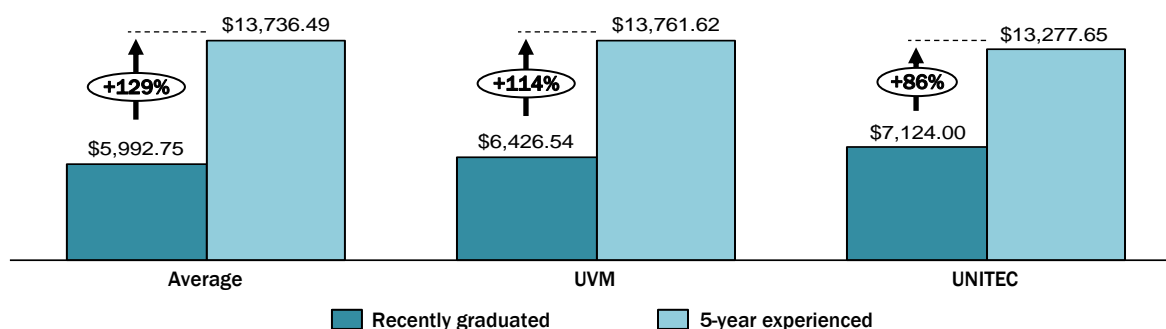
Percentage of Graduates who Recently got Promoted



Source: C230-IFC Graduates' survey 2014.

Employers agree that Laureate alumni have a positive outlook for career advancements and this increases their compensation. They consider that it is feasible for a Laureate graduate who has five years of work experience to achieve an increase in compensation.

Figure 16. Salary Offered to a Recently Graduated and a 5-Year Experienced Average Graduate (MXN), UVM, and UNITEC Graduate



Source: C230-IFC Employers' survey 2014.

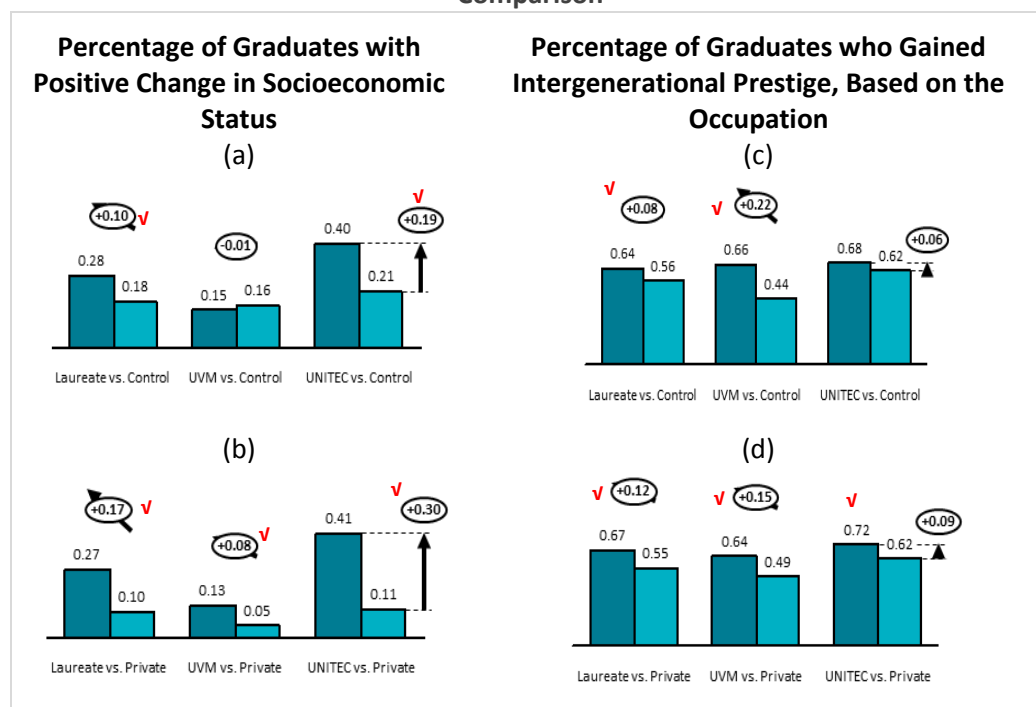
During in-depth interviews, both UNITEC and UVM alumni agreed that they have competitive skills to access mid-level management positions in important companies. However, they also recognized that more barriers exist when trying to reach certain top management positions. There is a perception that graduates from private premium universities have easier access to high level positions due to social networks.

Laureate alumni also believe that Laureate institutions are contributing positively to their career advancement by providing them with more management tools for their jobs. An UVM graduated declared: "There are many courses that are focused on managing, knowing your people, knowing how to lead". However, another group of Laureate graduates advocated that leadership skills must be taught at Laureate institutions with the same high level of effectiveness that is carried out at private premium universities.

v. Changes in Socioeconomic Status

A Laureate education is having a positive impact on the socioeconomic status of its alumni. The percentage of Laureate graduates who have experimented positive changes in their socioeconomic index (based on the values of the AMAI, comparing prior to enrollment and at the time of the survey) is 55% higher for Laureate graduates than the entire control group (28% vs 18%, respectively). This difference is statistically significant also for UNITEC graduates (difference of 89% or 19 percentage points higher). When compared only to the private universities, the differences are larger, positive and significant for Laureate (1.7 times higher), UVM (1.6 times higher) and UNITEC (2.67 times higher) (Figure 17, graphs a and b).

Figure 17. Impacts and Means of Outcome Variables Related to Changes in Socioeconomic Status, by Types of Comparison

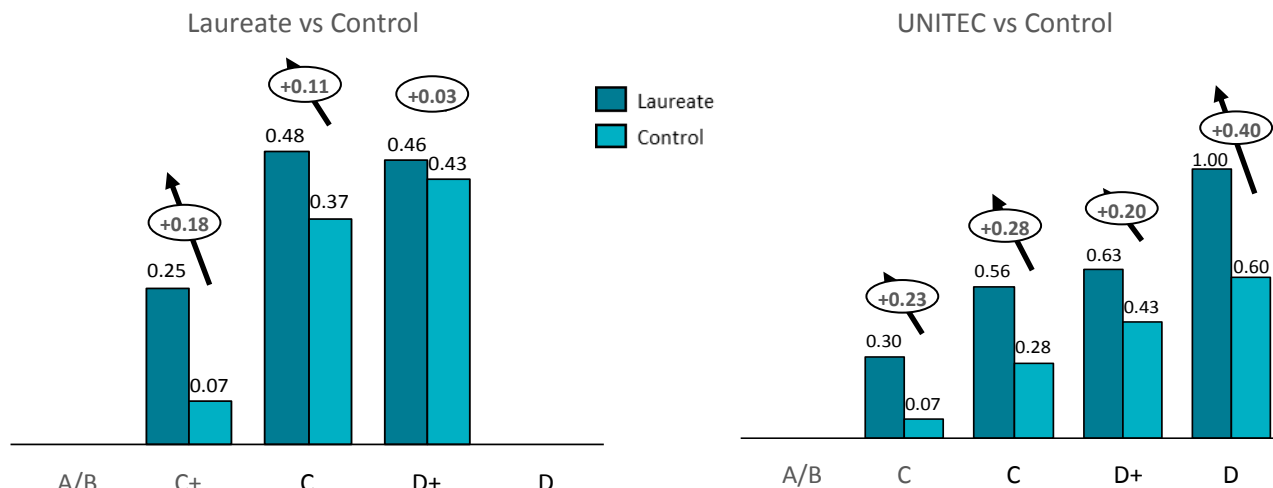


Note: ✓ denotes at least a 95% level of statistical significance.

Source: C230-IFC Graduates' survey 2014.

Figure 18 presents the distribution of these effects for UNITEC, by socioeconomic level before enrollment. **It clearly shows that a UNITEC education has an impact across students with different socioeconomic backgrounds.** For those in the D segment (lower income) particularly, virtually all of the students experienced an upward change (a 67% difference when compared to the entire control group). But also, individuals with a middle class background experienced the strongest effects. For individuals in segment C+, the difference with the control group is more than 300% and for those in the C segment, the difference is 100%. The results are not significant for UVM graduates.

Figure 18. Distribution of Impact in Positive Change in Socioeconomic Index (AMAI) in Percentage Points for Laureate and UNITEC, by Socioeconomic Level Before Enrolment



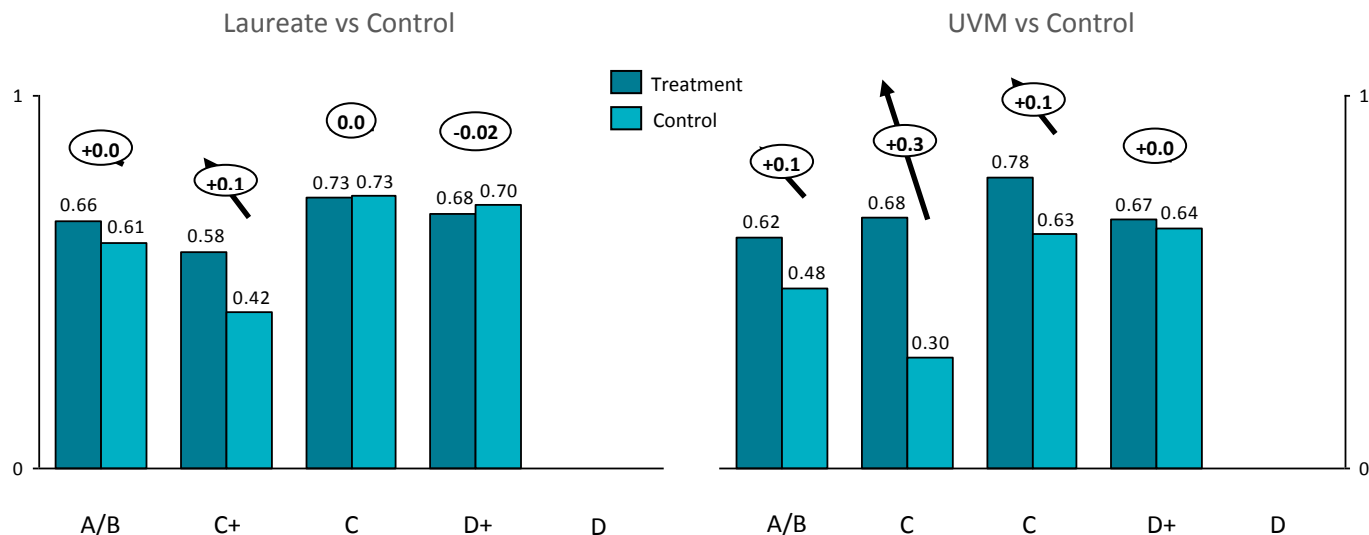
Source: C230-IFC Graduates' survey 2014.

A higher percentage of Laureate graduates have gained intergenerational prestige based on their occupation.⁶⁷ The evaluation finds that the percentage of graduates who have experienced positive changes in the index of intergenerational prestige based on their occupation is 14% higher and significant for Laureate graduates (the average change is 64% in the Laureate group and 56% in the control group). The comparison against only private universities shows significant impacts for Laureate (difference 22% higher), UVM (difference 31% higher) or UNITEC (difference 16% higher) graduates. **This effect is particularly significant and consistent for UVM graduates with a 50% difference when compared to the entire control group** (Figure 17, graphs e and f). This is equivalent to moving from an occupation such as mechanical maintenance worker (for parents) to a department coordinator in a company or government agency (for alumni). Figure 19 presents the distribution of the “impact in positive change in percentage of graduates who gained intergenerational occupational prestige” for Laureate and UVM graduates, by socioeconomic level before enrollment.⁶⁸ For all strata, there was a positive change. However, for those in the C+ segment, typically middle class, the increase was more dramatic, a more than 200% difference compared to the entire control group.

⁶⁷ See Appendix 6: Prestige Based on Occupation Methodology.

⁶⁸ Both graduates and their parents' occupation prestige were calculated at the time of the survey. According to CAMSIS, unemployed individuals and homemakers have a prestige scale of 0.

Figure 19. Distribution of Impact in Positive Change in Percentage of Graduates who Gained Intergenerational Prestige for UVM, by Socioeconomic Level Before Enrolment



Source: C230-IFC Graduates' survey 2014.

Although many of the Laureate graduates interviewed declared that they have maintained their previous socioeconomic status, some of them perceived an upwards change, especially to the highest social stratum. In particular, some pointed out that entrepreneurship, access to jobs with clear career opportunities, and their aspirations to achieve top management positions constitute the best ways to move upward in the socioeconomic scale. **The in-depth interviews also revealed some contrast between the socioeconomic situation of UVM and UNITEC alumni during their early personal life.** While almost every interviewee from UVM declared the economic situation of her family to be stable during her childhood, UNITEC graduates may have had a relatively more difficult childhood. This may explain why UNITEC graduates may be more likely to experience economic mobility, since they come from lower socioeconomic levels than UVM graduates. For example, while an undergraduate from UVM declared: *"Fortunately, during my childhood, we [my parents, siblings, and I] were in a quite comfortable economic situation, with no unmet needs, two cars, our own house..."*; in contrast, a quote from UNITEC exposed that: *"It was a neighborhood without public services and the streets were unpaved. Our family moved here when the house was just a concrete slab of flooring and we began building it up from there."*

Matching estimators rely on the strong assumption that observable covariates fully explain the difference between the treatment and control groups. However there is a risk that when there are unobserved factors that may explain individual self-selection, the matching estimates are biased. Given the *ex-post* design of the impact evaluation, it is impossible to know how prospective students made the decision to join a Laureate institution or any of the alternatives, and to what extent there were unobserved covariates shaping such decision.

In order to follow high standards of methodological rigor, a study must test the validity of estimates. Rosembaum⁶⁹ proposes a sensitivity analysis methodology in order to test the validity of the matching estimates when unobserved covariates affect the probability of treatment. Following an approach to implement this test proposed by Keele,⁷⁰ “Rosembaum bounds” were estimated for the p-value of all the matching estimates of this study.⁷¹ The results of the sensitivity analysis indicate that the findings presented in this section are highly sensitive to the presence of unobserved covariates; in other words, findings would not be robust if unobservable variables have shaped the schooling decision of the study sample.⁷²

Research on education outcomes poses the methodological challenge of dealing with unobservable variables, such as student’s motivation. This unobservable factor may be correlated with the decision of attending a Laureate university and likewise correlated to outcomes such as employability, income, career advancement, and social progress. Similarly, as mentioned earlier, non-response bias⁷³ imposes another internal validity threat, which is dealt through Multiple Imputation. Thirdly, the employment differences between the telephone and the face-to-face survey may be confounding with treatment effects, and producing imprecise impact estimates.

A final methodological consideration is the external validity of the study. The matched sample may not be a representative sample of Laureate population. Matching procedures reduce the sample so as to make comparable treatment and control groups. Such contraction of the sample compromises the study’s capacity to extrapolate conclusions to all Laureate education. Moreover, the study excluded executive programs and specific majors from the impact analysis, and so conclusions must be taken with caution when speaking broadly about Laureate.

⁶⁹ Rosembaum, Paul R. *Observational Studies* 2nd edition. New York: Springer, 2002.

⁷⁰ Keele, Luke. "An overview of rbounds: An R package for Rosenbaum bounds sensitivity analysis with matched data." 2010.

⁷¹ Implemented using the *rbounds* package in R, see (Keele 2010).

⁷² A variation of 20% in the probability of being assigned to the treatment group deems all of the results not significant.

⁷³ In the section of “missing observations” analysis, it is explained that a systematic difference of responses rates to certain questions between control and treatment groups, could produce a treatment and control group not entirely comparable.

6. Recommendations and Conclusions

Graduating from my university has given me the greatest satisfaction of my past few years.

Laureate alumnus

Laureate universities offer higher education degrees that enhance the performance of their undergraduates in the labor market and provide more opportunities and pathways for social mobility relative to other affordable education alternatives. This is particularly relevant in the Mexican context where there is an unmet demand for college degrees and private universities face a highly competitive market to expand their services. **Laureate is contributing to expand not only the quantity of educational facilities, but the quality as well.**

Through this evaluation, it was possible to identify significant impacts of a Laureate education in most of the analyzed outcome variables. In general, when compared to the control group, the most robust results⁷⁴ indicate that Laureate has a positive effect on aspects including:

- Employability: Laureate graduates spent less time when searching for their first job after graduation than their counterparts in other private and public universities. UNITEC's graduates show a particularly higher employment rate compared to graduates from other private universities.
- Income and job quality: More graduates from the Laureate universities have monthly wages and incomes higher than their counterparts.
- Career advancement: More Laureate graduates were promoted recently and were more likely to hold management positions than graduates in the control group.
- Gender gaps: Female graduates from Laureate were more likely to hold management positions than females in the control group.
- Social progress: More Laureate graduates have moved upward from their previous socioeconomic status (based on household socioeconomic level) than their peers. Furthermore, a higher number of Laureate graduates registered positive changes in their occupational prestige, compared to their parents.

Results are consistent across both control groups, one of which consisted of both public and private universities and one of which consisted of only private universities. However, some negative impacts were also found. Laureate alumni spent more consecutive time unemployed since graduation. They also reported that their studies had been less relevant for their professional careers than their counterparts from other universities.

The main findings are consistent and reinforce each other. A correlation analysis (presented in Appendix 2. Quasi-Experimental Impact Evaluation (based on Graduates' Survey), section D) shows, for example, that those graduates who spent less time looking for their first job after college were more likely to have been promoted recently and to be holding a management position. They also tend to be more satisfied with their jobs, have a higher income, and have spent less time unemployed.

Mexico is a country with signs of high inequality and low social mobility,⁷⁵ a fact that is evident in the Graduate Survey conducted for this study.⁷⁶ Within this context, the positive effects of a Laureate education on social mobility are noteworthy. The study's two key findings are as follows. Firstly, a UNITEC education helps its college graduates get better paying jobs compared to their parents. This is particularly significant because their target student body tends to come from lower socioeconomic classes. **UNITEC is contributing to social mobility through higher income.** This study shows that UNITEC provides an education with high returns, which becomes an avenue for social mobility. Over one tenth of UNITEC graduates were able to join the highest socioeconomic strata after graduation. Secondly, UVM, with students from relatively more affluent backgrounds, helps its college graduates get more prestigious jobs compared to their parents. **UVM is contributing to social mobility through occupational prestige.** Further research

⁷⁴ All the results presented in this section refer to a 95% level of statistical significance.

⁷⁵ Vélez- Grajales et al, "Informe de Movilidad Social en México 2013. Imagina tu Futuro". Centro de Estudios Espinosa Yglesias. Mexico, 2012.

⁷⁶ Intergenerational correlation between socioeconomic statuses, highest attained level of education and income is positive and significant for the whole sample, for the control group and for UVM graduates.

on the effects of affordable higher education in more or less mobile societies would be an important contribution to the field.

While the effects of Laureate education on career advancement among male students are significant and robust, these effects are many times larger for female students. Female alumni of Laureate universities advance in their careers at a faster pace than their female peers from other universities. This study provides preliminary insights about how Laureate can become an instrument to close the gap between men and women in career opportunities.

Based on in-depth interviews, the study found that Laureate alumni chose to join either UVM or UNITEC for reasons including name recognition, the flexibility in the academic system, and affordable tuition. They share the perception that their degree helped them to enter the job market successfully. These interviews also provided hints that some Laureate college graduates were rejected by public universities (UNAM and IPN). This study shows that a Laureate degree is a sound choice not only because it is affordable, but because it provides high returns on their educational investment and avenues to social mobility.

Potential employers perceive that Laureate alumni have competitive skills compared to undergraduates from other universities, including those in the premium segment. Because of this, recent Laureate graduates receive higher-than-average levels of compensation and many receive a promotion in the same time-lapse as their “premium” counterparts. Employers, in many cases, see that Laureate graduates are as valuable as graduates from public universities and premium private universities.

Laureate students are attractive at first glance and find jobs quickly, but at the same time they spent more time unemployed, which could point to a contradiction. However, this does not mean that graduates may be attractive for the market at graduation but less competitive in the longer term. The study finds that Laureate recent graduates are attractive, but also, that they develop long term skills: more Laureate graduates have outperformed the career advancement of non-Laureate graduates.

Perhaps the most significant limitation of this study is that, while it identifies Laureate’s high-achieving graduate performance, it cannot explain what the specific mechanisms that explain these results are. This opens an opportunity for further research. It is important to understand what Laureate is doing better than its competitors. What mechanisms can explain these high returns on educational investment? How do career services, academic curriculum, professors’ training, flexible schedules, opportunity to work during studies, and social networks affect social mobility outcomes? Both policy makers and private investors need to further understand how to improve higher education. Finally, this is a first study about the effects of access to affordable higher education on social mobility. The next generation of studies on social mobility and affordable higher education should explore shifting research focus from access to education quality.

From Laureate’s perspective, this study shows strong positive results. Laureate stakeholders could benefit from considering the implications of this study. Students make educational decisions without sufficient information about the higher education market. Laureate provides higher returns on educational investment than their competitors, and prospective students should know this so that they can make better decisions. Laureate should share and publicize the findings of this study to convey that Laureate is a sound investment vis-a-vis their competitors. From a policy perspective, affordable private education like Laureate is providing accessible and high-quality higher education. Private higher education is worth exploring further as a solution to education access, and as a key player in building stronger labor markets.

I owe a lot to my university. It gives you a different perspective on the world and what you can do with the knowledge you gain there. I recommend my university whenever I have the chance to do so.

Laureate alumnus

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8. Appendix

Appendix 1. Enrollment per Major at UVM and UNITEC in Mexico City Metropolitan Area During 2013

Enrollment per major at UVM and UNITEC during 2013

Majors	UVM		UNITEC		LAUREATE	
	Enrollment per Major	Percentage respect to total enrollment	Enrollment per Major	Percentage respect to total enrollment	Enrollment per Major	Percentage respect to total enrollment
Total Enrollment per University	29,796	100%	33,763	100%	63,559	100%
<i>Social Sciences Department</i>						
Law	4,756	16%	5,183	15%	9,939	16%
Education	516	2%	1,083	3%	1,599	3%
<i>Business-Economics Department</i>						
Business Administration	5,209	17%	4,343	13%	9,552	15%
Accounting	1,402	5%	2,147	6%	3,549	6%
Marketing	3,201	11%	2,957	9%	6,158	10%
<i>Health Sciences Department</i>						
Psychology	3,012	10%	3,447	10%	6,459	10%
<i>Engineering Department</i>						
Computation Science	1,756	6%	2,779	8%	4,535	7%
Industrial Engineering	1,265	4%	746	2%	2,011	3%
Information Technologies	69	0%	934	3%	1,003	2%
<i>Architecture and Design Department</i>						
Architecture	1,038	3%	1,821	5%	2,859	4%
Graphic Design	1,528	5%	2,984	9%	4,512	7%
Total Enrollment of Selected Majors	23,752	80%	28,424	84%	52,176	82%

Source: C230's analysis, based on data from ANUIES, 2014.

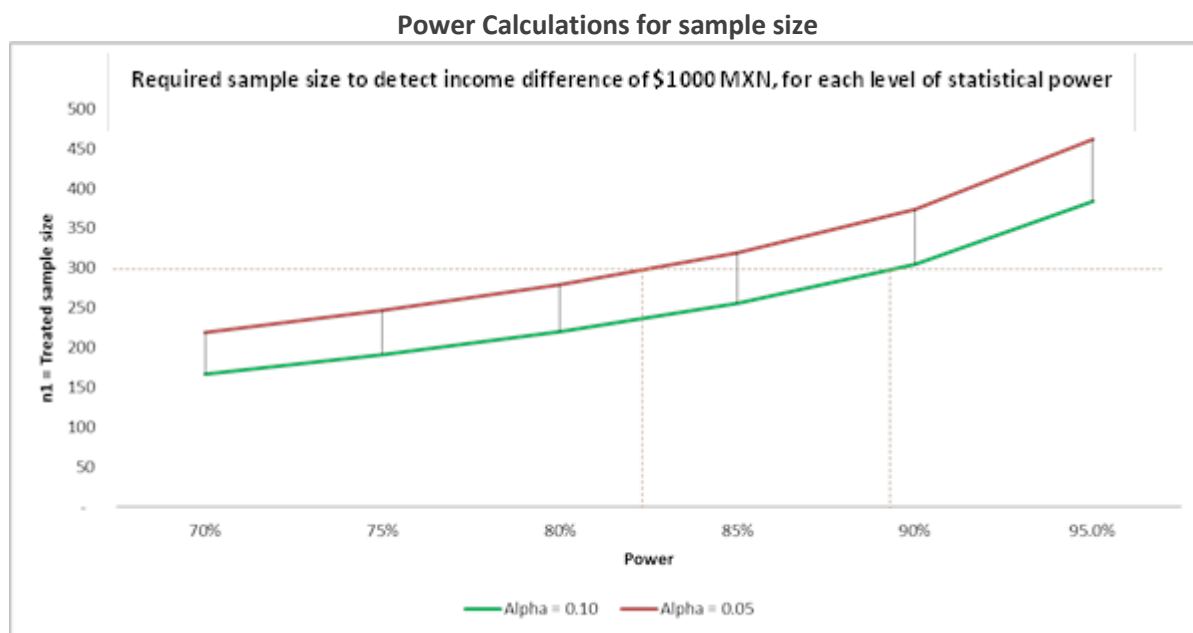
Appendix 2. Quasi-Experimental Impact Evaluation (based on Graduates' Survey)

A. Sample Composition and Power Calculations

The size of the sample is a key element to adequately identify the effects of attaining a Laureate degree, vis-à-vis other academic institutions. The larger the sample size, the higher the likelihood of detecting a statistically significant difference in outcome variables between graduates from a Laureate institution and graduates from other institutions of higher education. Moreover, as sample size increases, an impact evaluation is able to identify effects with a higher precision.

The National Employment and Occupation Survey (*Encuesta Nacional de Ocupación y Empleo, ENOE*) provided data on education, income, and employment status for the population of Mexico that was used in the power calculations. Specifically, the estimation was conducted for individuals currently between 25 and 35 years old, with 16 years of schooling or more, and who reported having reached the level of higher education (*Media Superior, Licenciatura or Posgrado*).

The main variable used in the power analysis is income. After analyzing the sample size needed to detect several levels of effect and according to the existing literature on education and Laureate's estimates about its alumni's income distribution, it would be desirable to detect an effect (or difference) of at least \$1,000 MXN in monthly income (equivalent to a change of 10% from the mean).⁷⁷ The power calculations showed that a sample of 300 graduates would be acceptable to detect the required difference in income the next figure.

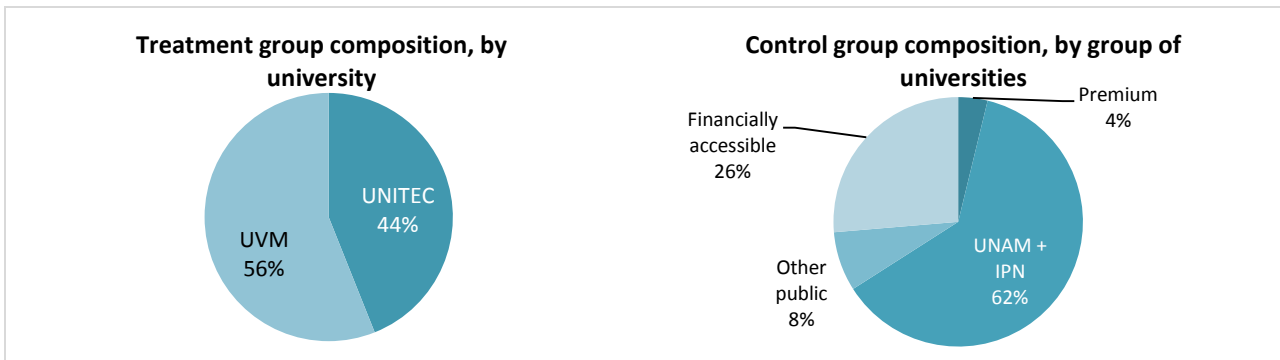


Source: C230 Consultores, based on ENOE 2014

⁷⁷ The income difference of \$1,000 MXN was fixed by Laureate, according to its knowledge of the institutions' graduates in the job market.

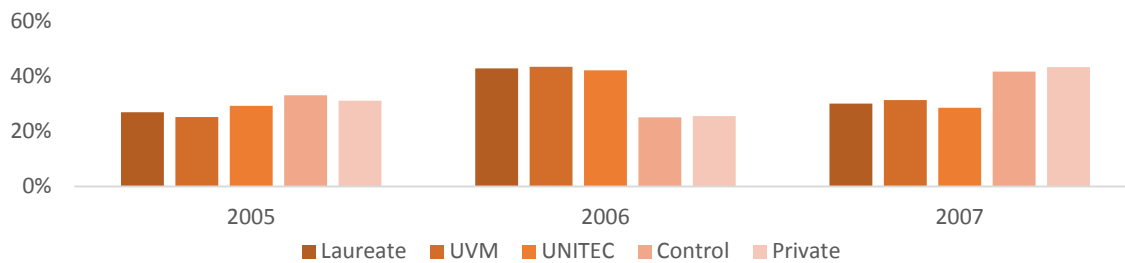
B. Statistics Regarding the (Pre-Matching) Sample Composition

a. Group of universities

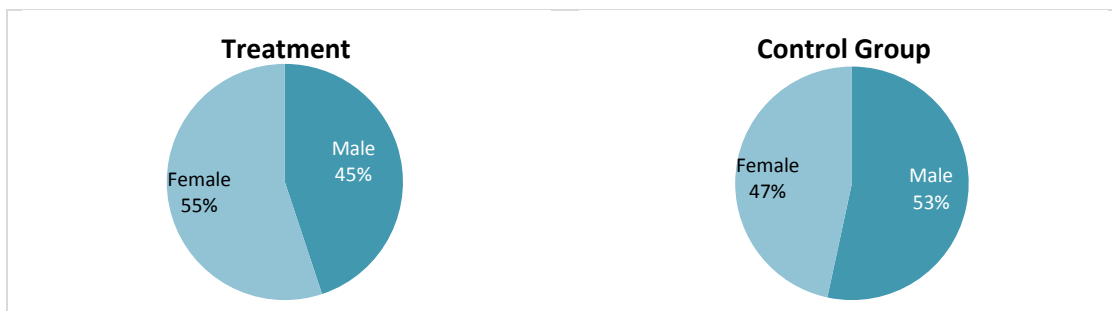


b. Years of Enrollment

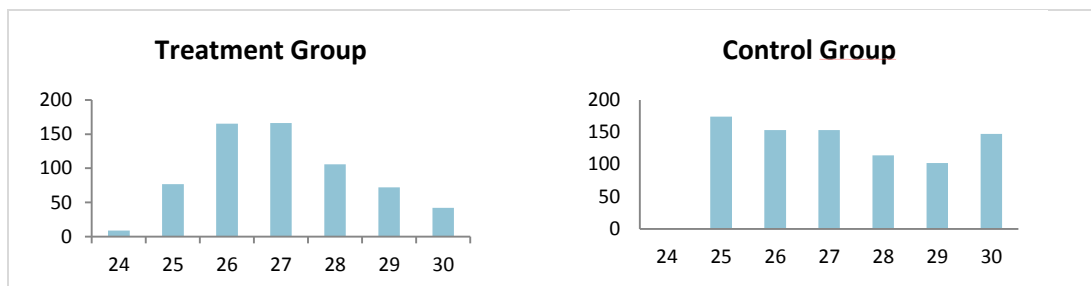
Distribution of the enrollment years of the graduates, by sample



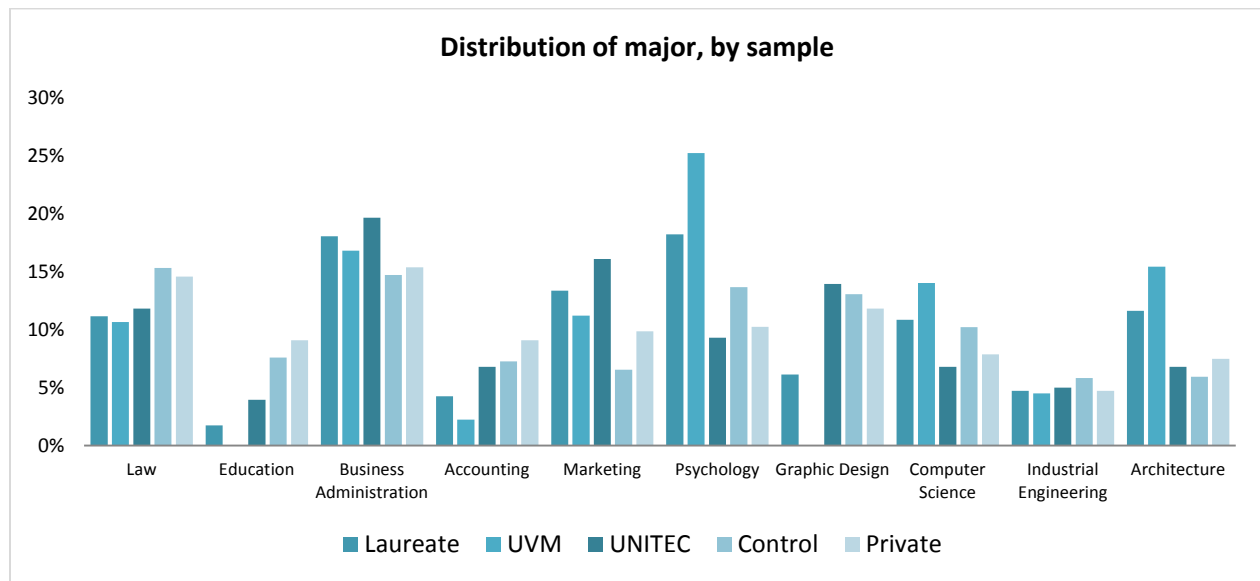
c. Gender



d. Age of Graduates



e. Majors



C. Results from the Impact Evaluation

Findings of the Impact Evaluation (Graduates' Survey)⁷⁸

Comparison: Treatment vs Control group (Public + Private universities)

Outcome variables		Laureate vs. Control			UVM vs. Control			UNITEC vs. Control			
		Parameters	CI (95%) [L , U]		Parameters	CI (95%) [L , U]		Parameters	CI (95%) [L , U]		
1	Income ⁷⁹	Estimator	\$648.28	-262.49	1559.05	\$775.11	-706.27	2256.49	\$883.28	-520.51	2287.08
		S.E.	463.99			754.68			715.16		
		P-value ⁸⁰	0.1665802	**		0.29856			0.2022986		
		Y-treated	\$12,114.47			\$11,819.86			\$12,440.38		
		Y-control	\$11,466.19			\$11,044.75			\$11,557.10		
		Difference_Y (%) ⁸¹	5.7%			7.0%			7.6%		
		N-treated	637			357			280		
		N-matches	401			293			242		
2	Satisfaction with current job	Estimator	-0.1360	-0.3102	0.0382	0.0428	-0.2370	0.3226	-0.1677	-0.4306	0.0952
		S.E.	0.0887			0.1423			0.1336		
		P-value	0.1251			0.7637			0.2095		
		Y-treated	5.7760			5.8235			5.7284		
		Y-control	5.9120			5.7807			5.8951		
		Difference_Y (%)	-2.3%			0.7%			-2.8%		
		N-treated	460			256			204		
		N-matches	250			187			161		
3	Percentage employed	Estimator	0.0065	-0.0460	0.0590	0.0390	-0.0541	0.1320	0.0462	-0.0281	0.1204
		S.E.	0.0267			0.0473			0.0378		
		P-value	0.8074			0.4105			0.2217		
		Y-treated	0.8567			0.8442			0.8821		
		Y-control	0.8502			0.8052			0.8410		
		Difference_Y (%)	0.8%			4.8%			4.9%		
		N-treated	520			288			232		
		N-matches	307			231			195		
4	Perceived usefulness of major	Estimator	-0.2049	-0.3807	-0.0291	-0.1625	-0.4481	0.1231	-0.0196	-0.2944	0.2552
		S.E.	0.0895			0.1454			0.1398		
		P-value	0.0221	**		0.2636			0.8885		
		Y-treated	5.6239			5.5458			5.6667		
		Y-control	5.8287			5.7083			5.6863		
		Difference_Y (%)	-3.5%			-2.8%			-0.3%		

⁷⁸ Results obtained using: Genetic Caliper Matching (in R). These results are previous to the Multiple Imputation.

⁷⁹ The impact on the variable Income was calculated using Multiple Imputation as a tool to fill the missing data with plausible values. The methodology proposed in King et al (2001) was implemented using the software Amelia II.

⁸⁰ P-value shows statistical significance of the Estimator at: 1% (***), 5% (**), and 10% (*).

⁸¹ Difference (%)=(Y_treated - Y_control)/Y_control

	N-treated	532			293		239	
	N-matches	327			240		204	
5	Employment benefits	Estimator	0.1429	0.0279 0.2579	0.2555		0.1818	-0.1065 0.4702
		S.E.	0.0584		0.1442		0.1462	
		P-value	0.0145 **		0.0764 *		0.2137	
		Y-treated	1.9850		1.9854		1.8788	
		Y-control	1.8421		1.7299		1.6970	
		Difference_Y (%)	7.8%		14.8%		10.7%	
		N-treated	353		204		149	
		N-matches	133		137		99	
6	Percentage of recently promoted	Estimator	0.0803	0.0111 0.1495	0.0909	-0.0175 0.1993	0.0438	-0.0587 0.1462
		S.E.	0.0352		0.0551		0.0521	
		P-value	0.0225 **		0.0991 *		0.4008	
		Y-treated	0.3534		0.3529		0.3540	
		Y-control	0.2731		0.2620		0.3043	
		Difference_Y (%)	29.4%		34.7%		16.3%	
		N-treated	458		255		203	
		N-matches	249		187		160	
7	Percentage in a management position	Estimator	0.0977	0.0346 0.1609	0.1385	0.0400 0.2371	0.0872	-0.0009 0.1753
		S.E.	0.0322		0.0501		0.0448	
		P-value ⁸²	0.0024 ***		0.0057 ***		0.0518 *	
		Y-treated	0.2638		0.2814		0.2667	
		Y-control	0.1661		0.1429		0.1795	
		Difference_Y (%) ⁸³	58.8%		97.0%		48.6%	
		N-treated	520		288		232	
		N-matches	307		231		195	
8	Time between graduation and first job (months)	Estimator	-1.3347	-2.6020 -0.0674	0.5877	-1.5129 2.6883	-1.7616	-3.3415 -0.1817
		S.E.	0.6453		1.0689		0.8036	
		P-value	0.0386 **		0.5824		0.0284 **	
		Y-treated	5.7072		6.5351		4.4742	
		Y-control	7.0419		5.9474		6.2358	
		Difference_Y (%)	-19.0%		9.9%		-28.2%	
		N-treated	516		286		230	
		N-matches	304		228		194	
9	Maximum time in unemployment (months)	Estimator	1.4361	0.3561 2.5161	2.7607	0.9936 4.5277	0.5539	-0.8975 2.0054
		S.E.	0.5500		0.8992		0.7383	
		P-value	0.0090 ***		0.0021 ***		0.4531	
		Y-treated	5.4704		6.4103		4.9265	
		Y-control	4.0343		3.6496		4.3725	
		Difference_Y (%)	35.6%		75.6%		12.7%	

⁸² P-value shows statistical significance of the *Estimator* at: 1% (***), 5% (**), and 10% (*).

⁸³ Difference (%)=(Y_treated - Y_control)/Y_control

	N-treated	522			286			236	
	N-matches	321			234			204	
10	Positive change in socioeconomic index (AMAI)	Estimator	0.1040	0.0489 0.1590	-0.0125	- 0.0865 0.0615		0.1893	0.1000 0.2786
		S.E.	0.0280		0.0377			0.0454	
		P-value	0.0002 ***		0.7400			0.0000 ***	
		Y-treated	0.2813		0.1500			0.4029	
		Y-control	0.1774		0.1625			0.2136	
		Difference_Y (%)	58.6%		-7.7%			88.6%	
		N-treated	531		293			238	
		N-matches	327		240			206	
11	Prestige (discr.) based on occupation (from parents to graduates)	Estimator	0.0789	0.0100 0.1479	0.2207	0.1148 0.3267		0.0564	- 0.0393 0.1521
		S.E.	0.0351		0.0539			0.0487	
		P-value	0.0246 **		0.0000 ***			0.2464	
		Y-treated	0.6414		0.6622			0.6769	
		Y-control	0.5625		0.4414			0.6205	
		Difference_Y (%)	14.0%		50.0%			9.1%	
		N-treated	507		278			229	
		N-matches	304		222			195	

Findings of the Impact Evaluation (Graduates' Survey)⁸⁴

Comparison: Treatment vs Private Universities

	Outcome variables		Laureate vs. Private			UVM vs. Private			UNITEC vs. Private		
			Parameters	CI (95%) [L , U]		Parameters	CI (95%) [L , U]		Parameters	CI (95%) [L , U]	
1	Income ⁸⁵	Estimator	1542.06	545.48	2538.64	1347.24	352.80	2341.68	2034.30	786.91	3281.69
S.E.		507.70			506.61			635.48			
P-value ⁸⁶		0.0011	***		0.0064	***		0.0001	***		
Y-treated		\$12,171.47			\$11,800.44			\$12,517.35			
Y-control		\$10,629.41			\$10,453.19			\$10,483.04			
Difference_Y (%) ⁸⁷		14.5%			12.9%			19.4%			
N-treated		637			357			280			
N-matches		229			117			106			
2	Satisfaction with current job	Estimator	-0.4444	-0.5847	-0.3041	-0.3898	-0.5486	-0.2310	-0.3582	-0.5302	-0.1862
S.E.		0.0712			0.0802			0.0870			
P-value		0.0000	***		0.0000	***		0.0000	***		
Y-treated		5.8175			5.9661			5.7015			
Y-control		6.2619			6.3559			6.0597			
Difference_Y (%)		-7.1%			-6.1%			-5.9%			
N-treated		460			256			204			
N-matches		126			59			67			
3	Percentage employed	Estimator	0.0000	-0.0453	0.0453	-0.0526	-0.1120	0.0067	0.0519	0.0073	0.0966
S.E.		0.0230			0.0301			0.0226			
P-value		1.0000			0.0799	*		0.0215	**		
Y-treated		0.8497			0.7763			0.9221			
Y-control		0.8497			0.8289			0.8701			
Difference_Y (%)		0.0%			-6.3%			6.0%			
N-treated		520			288			232			
N-matches		153			76			77			
4	Perceived usefulness of major	Estimator	-0.4286	-0.5529	-0.3042	-0.4937	-0.6499	-0.3375	-0.3375	-0.4735	-0.2015
S.E.		0.0632			0.0791			0.0689			
P-value		0.0000	***		0.0000	***		0.0000	***		
Y-treated		5.6646			5.7215			5.6000			
Y-control		6.0932			6.2405			5.9375			
Difference_Y (%)		-7.0%			-8.3%			-5.7%			
N-treated		532			293			239			
N-matches		161			79			80			
5	Employment	Estimator	-0.0645	-0.1494	0.0204	-0.0690	-0.1498	0.0119	0.0313	-0.0790	0.1415

⁸⁴ Results obtained using: Genetic Caliper Matching (in R).

⁸⁵ The impact on the variable Income was calculated using Multiple Imputation as a tool to fill the missing data with plausible values. The methodology proposed in King et al (2001) was implemented using the software Amelia II.

⁸⁶ P-value shows statistical significance of the Estimator at: 1% (***), 5% (**), and 10% (*).

⁸⁷ Difference (%)=(Y_treated - Y_control)/Y_control

	benefits	S.E.		0.0429			0.0404			0.0552					
		P-value		0.1324			0.0876	*		0.5713					
		Y-treated		2.0968			2.2069			2.0625					
		Y-control		2.1613			2.2759			2.0313					
		Difference_Y (%)		-3.0%			-3.0%			1.5%					
		N-treated		353			204			149					
		N-matches		62			29			32					
6	Percentage of recently promoted	Estimator		0.2480	0.1905	0.3055		0.2881	0.2234	0.3528		0.1667	0.0683	0.2045	
		S.E.		0.0292				0.0327				0.0345			
		P-value		0.0000	***			0.0000	***			0.0000	***		
		Y-treated		0.3920				0.4068				0.3788			
		Y-control		0.1440				0.1186				0.2121			
		Difference_Y (%)		172.2%				242.9%				78.6%			
		N-treated		458				255				203			
N-matches		125				59				66					
7	Percentage in a management position	Estimator		0.1046	0.0544	0.1548		0.1184	0.0626	0.1742		0.1039	0.0447	0.1630	
		S.E.		0.0255				0.0282				0.0299			
		P-value ⁸⁸		0.0000	***			0.0000	***			0.0005	***		
		Y-treated		0.2418				0.2368				0.2468			
		Y-control		0.1373				0.1184				0.1429			
		Difference_Y (%) ⁸⁹		76.2%				100.0%				72.7%			
		N-treated		520				288				232			
N-matches		153				76				77					
8	Time between graduation and first job (months)	Estimator		-2.6078	-3.7846	-1.4311		-1.8553	-	3.4189	-0.2916		-3.8961	-5.1681	-2.6241
		S.E.		0.5980				0.7914				0.6439			
		P-value		0.0000	***			0.0191	**			0.0000	***		
		Y-treated		5.5752				6.9211				4.2468			
		Y-control		8.1830				8.7763				8.1429			
		Difference_Y (%)		-31.9%				-21.1%				-47.8%			
		N-treated		516				286				230			
N-matches		153				76				77					
9	Maximum time in unemployment (months)	Estimator		2.0256	1.2885	2.7628		2.6962	1.7005	3.6920		1.3974	0.6545	2.1403	
		S.E.		0.3746				0.5041				0.3761			
		P-value		0.0000	***			0.0000	***			0.0002	***		
		Y-treated		4.8590				5.0127				4.7692			
		Y-control		2.8333				2.3165				3.3718			
		Difference_Y (%)		71.5%				116.4%				41.4%			
		N-treated		522				286				236			
N-matches		156				79				78					
10	Positive change in socioeconomic	Estimator		0.1739	0.1267	0.2211		0.0759	0.0361	0.1158		0.3000	0.2379	0.3621	
		S.E.		0.0240				0.0202				0.0315			
		P-value		0.0000	***			0.0002	***			0.0000	***		

⁸⁸ P-value shows statistical significance of the *Estimator* at: 1% (***), 5% (**), and 10% (*).

⁸⁹ Difference (%)=(Y_treated - Y_control)/Y_control

	index (AMAI)	Y-treated	0.2733		0.1266		0.4125	
		Y-control	0.0994		0.0506		0.1125	
		Difference_Y (%)	175.0%		150.0%		266.7%	
		N-treated	531		293		238	
		N-matches	161		79		80	
11	Prestige (discr.) based on occupation (from parents to graduates)	Estimator	0.1192	0.0595 0.1790	0.1487	0.1001 0.2512	0.0946	0.0477 0.1686
		S.E.	0.0304		0.0363		0.0300	
		P-value	0.0001 ***		0.0000 ***		0.0016 ***	
		Y-treated	0.6689		0.6351		0.7162	
		Y-control	0.5497		0.4865		0.6216	
		Difference_Y (%)	21.7%		30.6%		15.2%	
		N-treated	507		278		229	
		N-matches	151		74		74	

D. Correlation Analysis

Correlation of outcome variables for Laureate graduates

	Income	Satisfaction with current job	Percentage employed	Perceived usefulness of major	Employment benefits	Percentage of recently promoted	Percentage in a management position	Time between graduation and first job	Maximum time in unemployment	Positive change in socioeconomic index (AMAI)	Prestige based on occupation
Income	1										
Satisfaction with current job	0.0171	1									
Percentage employed	0.0418	-0.0408	1								
Perceived usefulness of major	-0.0158	0.2107*	0.0787*	1							
Employment benefits	-0.053	0.2093*	-0.054	0.0583*	1						
Percentage of recently promoted	0.0221	0.0724*	0.0687*	-0.0106	0.1805*	1					
Percentage in a management position	0.0262	0.0423	0.0919*	-0.0061	0.0352	0.1739*	1				
Time between graduation and first job	-0.0039	-0.1217*	-0.1148*	-0.0283	-0.1331*	-0.1316*	-0.1179*	1			
Maximum time in unemployment	-0.0029	-0.1655*	-0.1940*	-0.1152*	-0.1386*	-0.1096*	-0.0529*	0.4994*	1		
Positive change in socioeconomic index (AMAI)	-0.027	-0.0095	0.0129	-0.0339	0.0322	0.0425	0.0500*	-0.0553*	-0.0119	1	
Prestige based on occupation	-0.0143	-0.0248	0.3582*	-0.0021	-0.0164	0.0323	0.0378	-0.0945*	-0.0437*	0.0427	1

* Statistical significance at 10%

Correlation of outcome variables for UVM graduates

	Income	Satisfaction with current job	Percentage employed	Perceived usefulness of major	Employment benefits	Percentage of recently promoted	Percentage in a management position	Time between graduation and first job	Maximum time in unemployment	Positive change in socioeconomic index (AMAI)	Prestige based on occupation
Income	1										
Satisfaction with current job	0.0171	1									
Percentage employed	0.0418	-0.0408	1								
Perceived usefulness of major	-0.0158	0.2107*	0.0787*	1							
Employment benefits	-0.053	0.2093*	-0.054	0.0583*	1						
Percentage of recently promoted	0.0221	0.0724*	0.0687*	-0.0106	0.1805*	1					
Percentage in a management position	0.0262	0.0423	0.0919*	-0.0061	0.0352	0.1739*	1				
Time between graduation and first job	-0.0039	-0.1217*	-0.1148*	-0.0283	-0.1331*	-0.1316*	-0.1179*	1			
Maximum time in unemployment	-0.0029	-0.1655*	-0.1940*	-0.1152*	-0.1386*	-0.1096*	-0.0529*	0.4994*	1		
Positive change in socioeconomic index (AMAI)	-0.027	-0.0095	0.0129	-0.0339	0.0322	0.0425	0.0500*	-0.0553*	-0.0119	1	
Prestige based on occupation	-0.0143	-0.0248	0.3582*	-0.0021	-0.0164	0.0323	0.0378	-0.0945*	-0.0437*	0.0427	1

* Statistical significance at 10%

Correlation of outcome variables for UNITEC graduates

	Income	Satisfaction with current job	Percentage employed	Perceived usefulness of major	Employment benefits	Percentage of recently promoted	Percentage in a management position	Time between graduation and first job	Maximum time in unemployment	Positive change in socioeconomic index (AMAI)	Prestige based on occupation
Income	1										
Satisfaction with current job	0.0171	1									
Percentage employed	0.0418	-0.0408	1								
Perceived usefulness of major	-0.0158	0.2107*	0.0787*	1							
Employment benefits	-0.053	0.2093*	-0.054	0.0583*	1						
Percentage of recently promoted	0.0221	0.0724*	0.0687*	-0.0106	0.1805*	1					
Percentage in a management position	0.0262	0.0423	0.0919*	-0.0061	0.0352	0.1739*	1				
Time between graduation and first job	-0.0039	-0.1217*	-0.1148*	-0.0283	-0.1331*	-0.1316*	-0.1179*	1			
Maximum time in unemployment	-0.0029	-0.1655*	-0.1940*	-0.1152*	-0.1386*	-0.1096*	-0.0529*	0.4994*	1		
Positive change in socioeconomic index (AMAI)	-0.027	-0.0095	0.0129	-0.0339	0.0322	0.0425	0.0500*	-0.0553*	-0.0119	1	
Prestige based on occupation	-0.0143	-0.0248	0.3582*	-0.0021	-0.0164	0.0323	0.0378	-0.0945*	-0.0437*	0.0427	1

* Statistical significance at 10%

Proportions of non-missing values in outcome variables for the matched sample, by treatment status

	Variables	Proportion of non-missing values		Difference (control-treated)	z-stat	p-value
		Control	Treated			
Outcome variables	Percentage currently employed	0.924	0.982	-0.058	-3.496	0.0005
	Time looking for first job	0.921	0.973	-0.052	-2.953	0.0031
	Max period in unemployment after graduation	0.997	0.979	0.018	2.134	0.0328
	Income	0.753	0.765	-0.012	-0.365	0.7149
	Employment benefits	0.442	0.668	-0.226	-5.814	0.0000
	Satisfaction with current job	0.802	0.866	-0.064	-2.203	0.0276
	Perceived usefulness of major	0.997	1.000	-0.003	-1.001	0.3169
	Percentage in management positions	0.924	0.982	-0.058	-3.496	0.0005
	Percentage recently promoted	0.802	0.863	-0.061	-2.090	0.0366
	Percentage with positive change in socioeconomic index (AMAI)	1.000	0.997	0.003	1.001	0.3169
	Percentage with positive change in intergenerational prestige based on occupation	0.939	0.957	-0.018	-1.057	0.2906

Note: The original number of observations is 1,480 (637 treated and 843 untreated). After the matching, the sample contained 328 observations in each group.

Source: C230-IFC Graduates' survey 2014.

Appendix 4. Comparative of Results Using Standard Approach (List-Wise Deletion) and Multiple Imputation.

Comparing findings of the Impact Evaluation (Graduates' Survey) ⁹⁰

Comparison: Treatment vs Control group (both public and private universities) using list-wise deletion and multiple imputation ⁹¹.

Outcome Variables			Laureate vs. Control		UVM vs. Control		UNITEC vs. Control	
			Listwise deletion	Multiple Imputation	Listwise deletion	Multiple Imputation	Listwise deletion	Multiple Imputation
1	Income	Estimator	946.43	648.28	187.02	775.11	-1180.92	883.28
		S.E.	593.71	463.99	659.48	754.68	699.66	715.16
		t statistic	1.5941	1.3971	0.2836	1.0271	-1.6878	1.2351
		Matches	251.000	401.600	197.000	293.800	149.000	242.400
2	Satisfaction with current job	Estimator	-0.136	-0.042	0.043	0.076	-0.168	-0.142
		S.E.	0.089	0.128	0.142	0.157	0.134	0.155
		t statistic	-1.534	-0.327	0.301	0.482	-1.255	-0.918
		Matches	250.000	401.600	187.000	293.800	161.000	242.400
3	Percentage employed	Estimator	0.007	0.023	0.039	0.012	0.046	0.027
		S.E.	0.027	0.027	0.047	0.039	0.038	0.037
		t statistic	0.244	0.882	0.823	0.300	1.222	0.742
		Matches	307.000	401.600	231.000	293.800	195.000	242.400
4	Perceived usefulness of major	Estimator	-0.205	-0.138	-0.163	-0.159	-0.020	-0.014
		S.E.	0.090	0.096	0.145	0.143	0.140	0.134
		t statistic	-2.288	-1.441	-1.118	-1.113	-0.140	-0.108
		Matches	327.000	401.600	240.000	293.800	204.000	242.400
5	Employment benefits	Estimator	0.143	0.109	0.255	0.128	0.182	0.041
		S.E.	0.058	0.133	0.144	0.130	0.146	0.095
		t statistic	2.446	0.821	1.772	0.985	1.243	0.434
		Matches	133.000	401.600	137.000	293.800	99.000	242.400
6	Percentage of recently promoted	Estimator	0.080	0.083	0.091	0.115	0.044	0.018
		S.E.	0.035	0.035	0.055	0.049	0.052	0.048
		t statistic	2.281	2.404	1.649	2.340	0.840	0.377
		Matches	249.000	401.600	187.000	293.800	160.000	242.400
7	Percentage in a management position	Estimator	0.098	0.086	0.139	0.098	0.087	0.075
		S.E.	0.032	0.036	0.050	0.045	0.045	0.043
		t statistic	3.038	2.426	2.763	2.205	1.945	1.767
		Matches	307.000	401.600	231.000	293.800	195.000	242.400
8	Time between graduation and first job (months)	Estimator	-1.335	-1.146	0.588	0.622	-1.762	-1.868
		S.E.	0.645	0.646	1.069	0.936	0.804	0.749
		t statistic	-2.068	-1.776	0.550	0.665	-2.192	-2.493
		Matches	304.000	401.600	228.000	294.200	194.000	242.400
9	Maximum time in unemployment (months)	Estimator	1.436	0.838	2.761	2.264	0.554	0.314
		S.E.	0.550	0.535	0.899	0.810	0.738	0.700
		t statistic	2.611	1.566	3.070	2.795	0.750	0.448
		Matches	321.000	401.600	234.000	293.800	204.000	242.400
10	Positive change in socioeconomic index (AMAI)	Estimator	0.104	0.113	-0.013	0.006	0.189	0.194
		S.E.	0.028	0.027	0.038	0.040	0.045	0.043
		t statistic	3.709	4.206	-0.332	0.155	4.167	4.499
		Matches	327.000	401.600	240.000	293.800	206.000	242.400
11	Prestige (discr.) based on occupation (from parents to graduates)	Estimator	0.079	0.074	0.221	0.149	0.056	0.073
		S.E.	0.035	0.036	0.054	0.051	0.049	0.048
		t statistic	2.247	2.038	4.095	2.900	1.159	1.516
		Matches	304.000	401.600	222.000	293.800	195.000	242.400

⁹⁰ Results obtained using: Genetic Caliper Matching (in R).

⁹¹ Multiple Imputation was used as a tool to fill the missing data with plausible values. The methodology proposed in King et al (2001) was implemented using the software Amelia II.

Comparing findings of the Impact Evaluation (Graduates' Survey) ⁹²

Comparison: Treatment vs Private Universities using list-wise deletion and multiple imputation ⁹³.

Outcome Variables		Laureate vs. Control (private only)		UVM vs. Control (private only)		UNITEC vs. Control (private only)		
		Listwise deletion	Multiple Imputation	Listwise deletion	Multiple Imputation	Listwise deletion	Multiple Imputation	
1	Income	Estimator	1042.92	1542.06	1191.46	1347.24	823.91	2034.30
S.E.		782.55	507.70	1052.40	506.61	1176.52	635.48	
t statistic		1.3327	3.0373	1.1321	2.6593	0.7003	3.2012	
Matches		101.000	229.000	57.000	117.000	61.000	106.000	
2	Satisfaction with current job	Estimator	-0.444	-0.138	-0.390	-0.127	-0.358	-0.186
S.E.		0.071	0.146	0.080	0.170	0.087	0.132	
t statistic		-6.239	-0.949	-4.862	-0.745	-4.119	-1.412	
Matches		126.000	222.200	59.000	118.000	67.000	105.000	
3	Percentage employed	Estimator	0.000	0.012	-0.053	-0.028	0.052	0.056
S.E.		0.023	0.024	0.030	0.031	0.023	0.026	
t statistic		0.000	0.478	-1.751	-0.899	2.299	2.145	
Matches		153.000	222.200	76.000	118.000	77.000	105.000	
4	Perceived usefulness of major	Estimator	-0.429	-0.444	-0.494	-0.493	-0.338	-0.373
S.E.		0.063	0.067	0.079	0.095	0.069	0.076	
t statistic		-6.779	-6.668	-6.243	-5.197	-4.899	-4.886	
Matches		161.000	222.200	79.000	118.000	80.000	105.000	
5	Employment benefits	Estimator	-0.065	0.165	-0.069	0.149	0.031	0.190
S.E.		0.043	0.088	0.040	0.109	0.055	0.106	
t statistic		-1.505	1.867	-1.708	1.358	0.566	1.793	
Matches		62.000	222.200	29.000	118.000	32.000	105.000	
6	Percentage of recently promoted	Estimator	0.248	0.195	0.288	0.248	0.167	0.133
S.E.		0.029	0.032	0.033	0.048	0.035	0.036	
t statistic		8.488	6.043	8.818	5.156	4.829	3.729	
Matches		125.000	222.200	59.000	118.000	66.000	105.000	
7	Percentage in a management position	Estimator	0.105	0.083	0.118	0.090	0.104	0.108
S.E.		0.026	0.025	0.028	0.035	0.030	0.036	
t statistic		4.099	3.277	4.192	2.585	3.470	3.017	
Matches		153.000	222.200	76.000	118.000	77.000	105.000	
8	Time between graduation and first job (months)	Estimator	-2.608	-1.402	-1.855	0.102	-3.896	-3.071
S.E.		0.598	0.929	0.791	1.008	0.644	1.018	
t statistic		-4.361	-1.509	-2.344	0.102	-6.051	-3.018	
Matches		153.000	222.200	76.000	118.000	77.000	105.500	
9	Maximum time in unemployment (months)	Estimator	2.026	1.445	2.696	2.084	1.397	0.964
S.E.		0.375	0.627	0.504	0.635	0.376	0.548	
t statistic		5.407	2.306	5.348	3.283	3.716	1.759	
Matches		156.000	222.200	79.000	117.500	78.000	105.000	
10	Positive change in socioeconomic index (AMAI)	Estimator	0.174	0.165	0.076	0.072	0.300	0.274
S.E.		0.024	0.034	0.020	0.059	0.031	0.045	
t statistic		7.249	4.796	3.762	1.217	9.535	6.098	
Matches		161.000	222.200	79.000	118.000	80.000	105.000	
11	Prestige (discr.) based on occupation (from parents to graduates)	Estimator	0.119	0.078	0.149	0.098	0.095	0.069
S.E.		0.030	0.040	0.036	0.040	0.030	0.050	
t statistic		3.927	1.949	4.092	2.446	3.148	1.381	
Matches		151.000	222.200	74.000	118.000	74.000	105.000	

⁹² Results obtained using: Genetic Caliper Matching (in R).

⁹³ Multiple Imputation was used as a tool to fill the missing data with plausible values. The methodology proposed in King et al (2001) was implemented using the software Amelia II.

Appendix 5: Measuring Social Class Using AMAI

The Mexican Association of Market Research and Public Opinion (AMAI) developed in 1994 a classification that allows the Mexican research industry to count with a homogeneous criterion to study, classify and explain their markets.

To standardize this measure, the AMAI defined 13 specific variables established by the committee of Socio Economic Levels. The Variables are:

1. Last year of studies of the family's head.
2. Number of lightbulbs at home.
3. Number of rooms (without bathrooms).
4. Number of baths with shower inside the home.

Possession of:

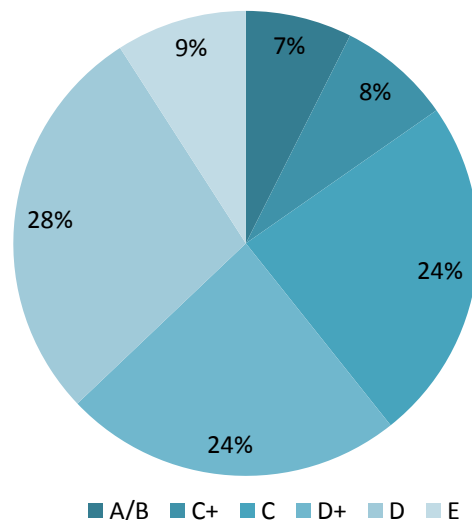
5. Cars
6. Boiler.
7. Kind of floor.
8. Vacuum Cleaner.
9. Computer (PC).
10. Microwave oven.
11. Washing machine.
12. Bread toaster.
13. DVD player.

With these 13 variables 6 levels were assigned.

- **A/B: Upper Class** – This is the segment with the highest life standards. The profile of the family head of these homes is composed by individuals with an education level of Bachelor degree or higher. They live in luxury houses or apartments with all the services and amenities.
- **C+: Upper Mid** – This segment contains those with income and/or lifestyle slightly superior to those of the middle class. The profile of the family head of these homes is of individuals with an educational level of Bachelor degree. Generally they live in houses or apartments of their own, some are luxury homes and they have all the amenities.
- **C: Middle Class** – This segment contains what is typically known as middle class. The profile of the family head of these homes is of individuals with an educational level of high school mostly. Homes belonging to this segment are houses or apartments that can be owned or rented with some amenities.
- **D+: Lower Mid** – This segment includes those homes with income and/or lifestyle slightly inferior to those of middle class. They possess the best life standards among the lower class. The profile of the family head of these homes is composed of individuals with an educational level of junior high or elementary school completed. Homes belonging to this segment are, in their majority, owned; although some people rent the property and some are social interest homes.
- **D: Low** – This is the middle segment of lower classes. The profile of the family head of these homes is formed by individuals with an educational level averaging elementary school (complete in most cases). Homes belonging to this segment are owned or rented like, tenement houses and council units or they are under frozen rents.
- **E: Lowest** - This segment is not usually included in marketing segmentation. The profile of the family head is of individuals with an educational level of unfinished elementary school. These people usually lack properties, so they live or use other resources to acquire housing. Usually many generations live under the same roof, and they are totally frugal.

The distribution of socioeconomic levels in Mexico City is presented in Figure 20. Distribution of AMAI socioeconomic levels in Mexico City.

Figure 20. Distribution of AMAI socioeconomic levels in Mexico City



Based on these criteria, the distinguished aspects of the socio economic composition of Mexico (as a country) are:

- Monthly family income per socio economic level in the country is estimated around \$0.00 to \$179 (USD) for level E; from \$180 to \$452 (USD) for level D; from \$453 to \$773 (USD) for level D+; from \$774 to 2,333 (USD) for level C; from \$2,334 to \$5,666 (USD) for level C+ and from \$5,667, or more (USD) for level A/B.
- From the total of urban areas in Mexico (which include those with more than 40,000 inhabitants), 7.5% belongs to A/B 13.6% to level C+ 18.8% to C; 32.6% to D+; 19.5% to D, and 8% to E.
- The average family educational level for each socioeconomic level is finished bachelor degree for level A/B; Incomplete bachelor for level C+; Associates degree or Unfinished bachelor for C; finished elementary or unfinished high school for D; Finished elementary for D, and unfinished elementary for level E.

Using AMAI to Measure Pre-Laureate Enrolment Socioeconomic Level and Current Socioeconomic Level

A key impact estimation of this study is to analyze changes in socioeconomic level, between pre-enrolling to a Laureate university program compared to the current socioeconomic level. Pre-enrolment compared to current level does not provide a long enough period of time to analyze intergenerational change; it is enough time, though, to observe if alumni are directing their lives into the “avenues” for social mobility.

The questionnaire applied to Laureate’s graduates was designed to estimate AMAI’s socioeconomic level before enrolling to Laureate education, as well as to estimate AMAI’s level at the moment of the survey. The responses to AMAI’s battery of questions that corresponded to both the pre-enrolment and the current socioeconomic level were elicited at the same time. One section of the questionnaire asked about AMAI variables pre-enrolment; and the following section asked the same questions for the current moment. The ideal research design would ask about the AMAI conditions of the parent at the moment of the respondent’s current age and compare such socioeconomic level to the current respondent level, but this type of questions would have caused recall bias. This research design entails that social progress (changes in socioeconomic level) is measured over a maximum period of 10 years. The current AMAI socioeconomic level from all respondents corresponds to 2014, and the pre-enrolment socioeconomic level would correspond to dates around 2005-07.

Appendix 6: Prestige Based on Occupation Methodology

The occupational prestige scale used in this study is based on the methodology developed by the Cambridge Social Interaction and Stratification Scale (CAMSIS) project, an internationally comparative assessment of the structures of social interaction and stratification across a number of countries. At its core lies the construction of occupational scales for each constituent country. Each country has a different prestige scale based on the value that each society puts on different occupations. The scale values represent an occupational unit's relative position within the national classification of social interaction and stratification. The theory behind CAMSIS implies that occupational groups are robust indicators of social stratification because employment still provides the major mechanism by which social and economic rewards are distributed directly or indirectly in modern societies and is the single most significant indicator of someone's location in the overall structure of advantage and disadvantage (Blackburn & Prandy, 1997). It is important to understand that 'occupational group' here is defined to include status differences in employment (self-employed or supervisory, for example), in addition to the conventional understanding of the meaning of "occupation." Furthermore, CAMSIS is gender-sensitive, i.e. different scales are calculated for men and women, since holding the same occupation may have different implications for the persons' social position, depending on their gender.

The theory behind CAMSIS scales (developed from the original 'Cambridge Scale') covers not just a particular measure but a whole distinctive theoretical approach to social stratification. Using large-scale survey datasets, sociologists are able to carry out empirical analyses of individual level data on features of, or attitudes about, occupations.

The "CAMSIS" approach to studying the relative stratification position of the incumbents of occupations exploits data on social connections between the incumbents of occupations. CAMSIS scales are scores given to occupations which indicate their position in the social stratification structure and can be used to compare occupational prestige across generations.⁹⁴

CAMSIS measures can be constructed by using data on 130 pairs of occupations linked by a social interaction, such as marriage, friendship, or parent-child relationships. First, a two-way cross-tabulation of the occupations for the first and second members of the pair is prepared. A score is assigned to each occupation to indicate its position within the empirical dimension(s) of social interaction. Prestige scores go from 0 (for instance, unoccupied or homemakers), which means that society does not regard this occupation highly in the prestige scale; to (approximately) 100 points (for example, doctors), which means that this occupation is highly regarded by society.

For this study, the relationship studied was the parent-child level. The main idea behind the analysis was to measure the upward mobility of the graduates, comparing their CAMSIS score with their parents'. This analysis was done for gender-specific pairs: mother-daughter and father-son. The average score for each subject of study is presented in the following table.

Subject	CAMSIS Score
Mother	25.88
Father	51.27
Daughter	60.36
Son	72.60

Hereby, some examples are presented to clarify the prestige scale used in the study and to illustrate the changes in occupational prestige across generations. Common occupations in the sample for a father are: sales workers,

⁹⁴ See www.camsis.stir.ac.uk for full details of contemporary CAMSIS scales and information on their derivation and exploitation.

dispatchers and clerks (53.45⁹⁵); drivers of buses and taxis (50.70); and engineers (73.00). Common occupations for the alumni (sons) are business administrators (81.02), programmers (71.69), and graphic designers (75.98).

In the case of mothers, common occupations are: homemakers (0.00⁹⁶); sales workers, dispatchers and clerks (49.62); and primary school teachers (65.73); for daughters (alumni) common occupations are teachers (67.79), graphic designers (83.03) and human resources (82.97).

An illustrative case of intergenerational change of occupational prestige would be for a father occupied in mechanical maintenance to have a son who is an optometrist; or for a mother who manufactures textile products to have a daughter who is a medical auxiliary; or for a parent who is a transport inspector with a Laureate alumni that is a real state agent.

The next figure presents the distribution of occupational prestige for UVM and UNITEC graduates and their parents', (the horizontal axis presents the prestige scale from 0 to 100, and the vertical axis, the proportion in each level).⁹⁷

⁹⁵ The numbers in parenthesis indicate the score within the prestige scale. This specific score means, for example, that clerks have a prestige score of 53.45, which is an occupation in the middle of the prestige scale.

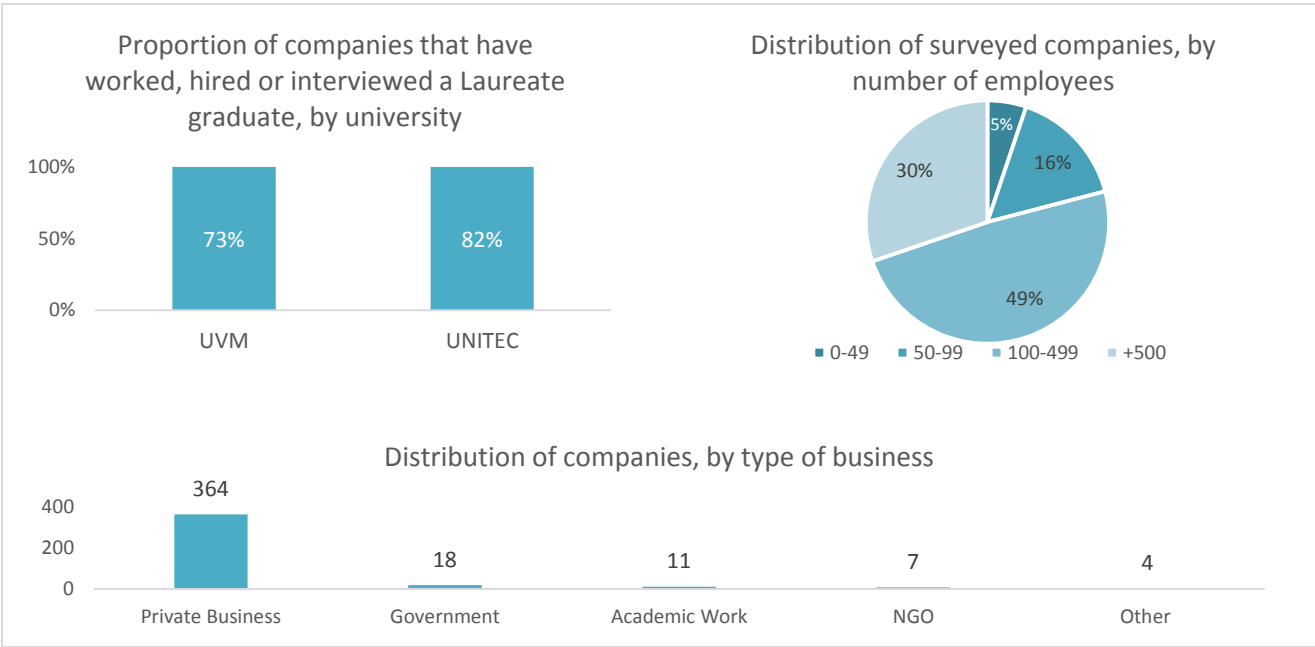
⁹⁶ Homemaker is a non-gender definition of housewife. This occupation has a score of 0 in social prestige scale, which means is lowly regarded in the Mexican context.

⁹⁷ Both graduates and their parents' occupation prestige were calculated at the time of the survey. According to CAMSIS, unemployed individuals and homemakers have a prestige scale of 0.

Distribution of Laureate alumni according to occupation prestige, before enrollment and at the time of the survey

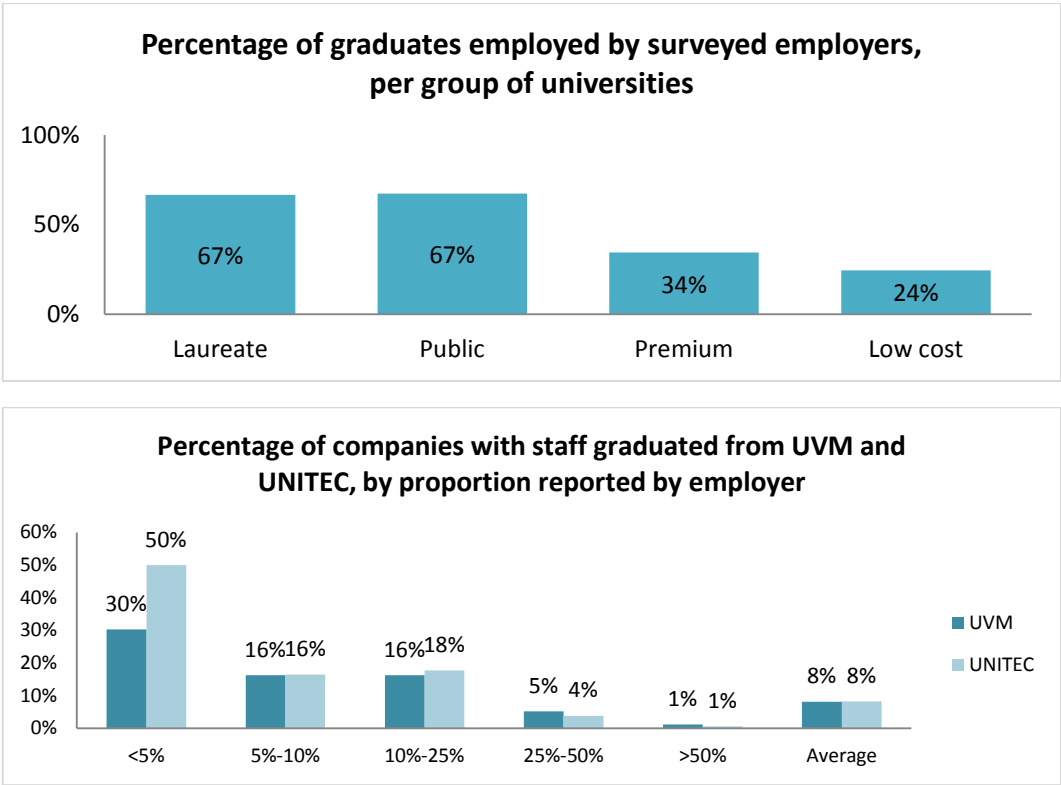


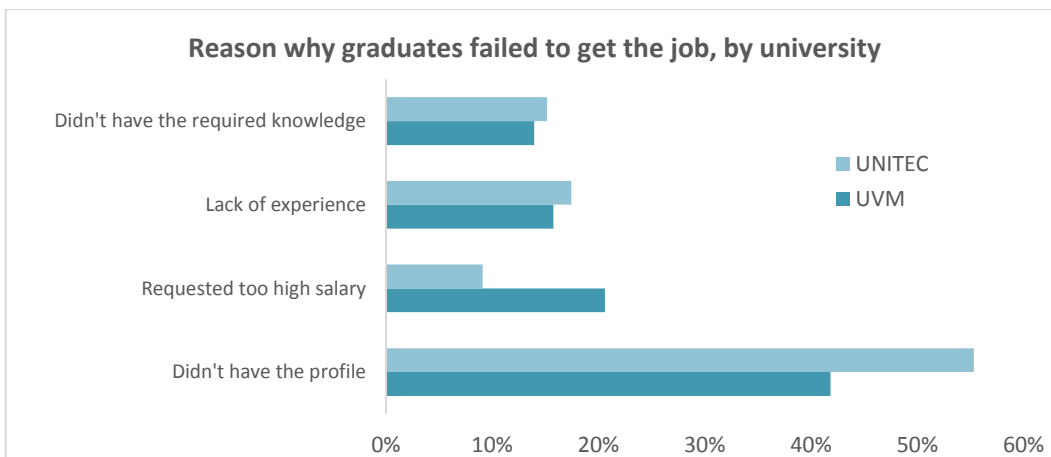
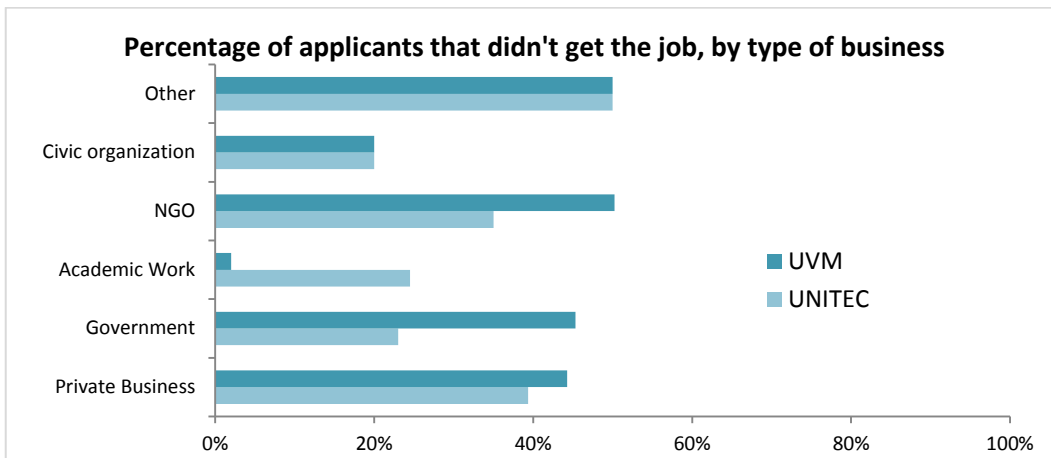
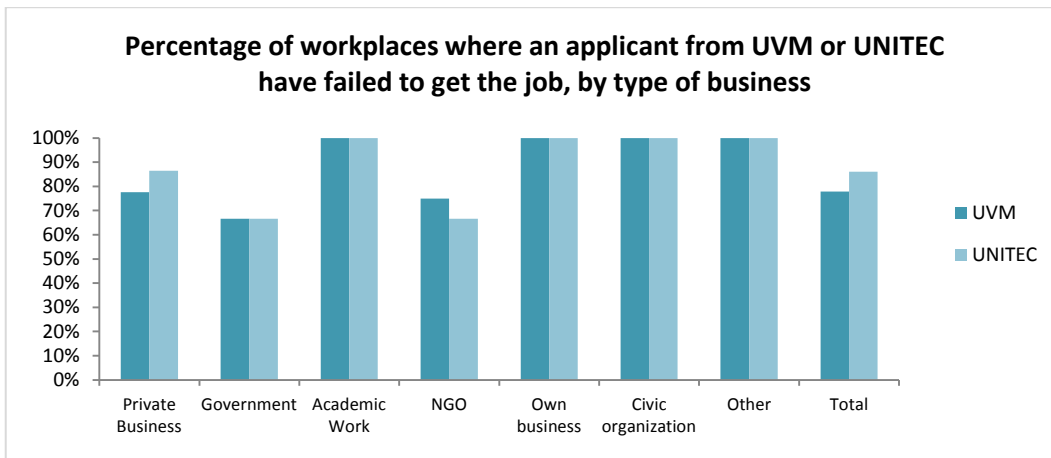
A. Sample Composition



Source: C230 Consultores

i. Employers' Experiences with Laureate and other Universities.

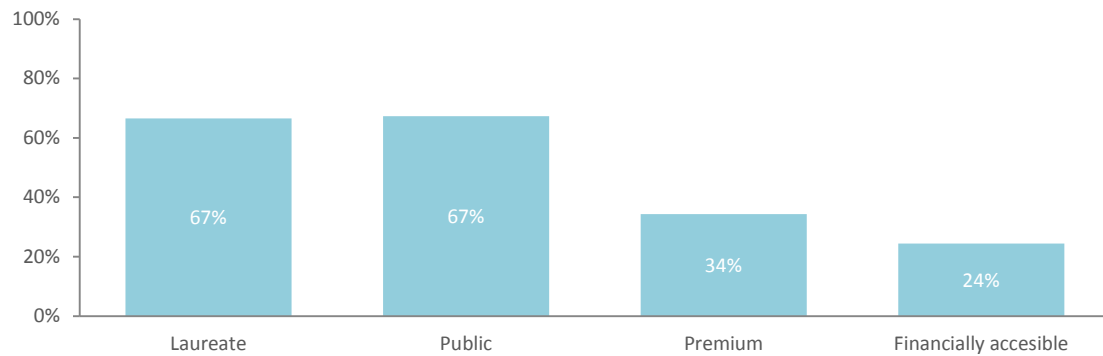




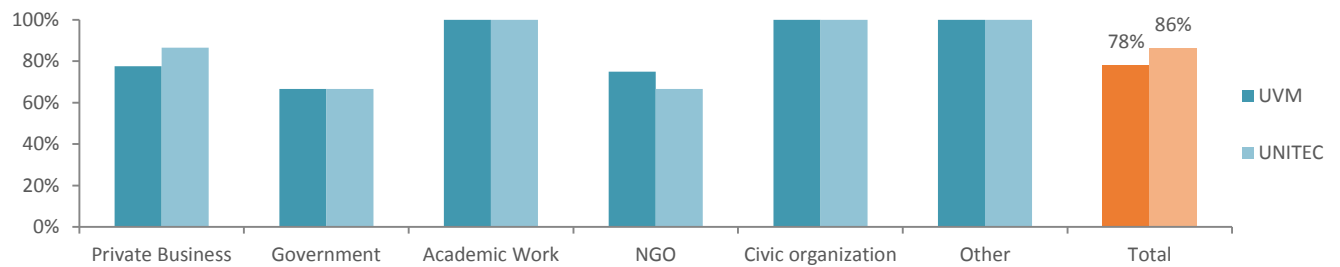
B. Results from Employers' Perceptions (Employers' Survey).

i. Employability

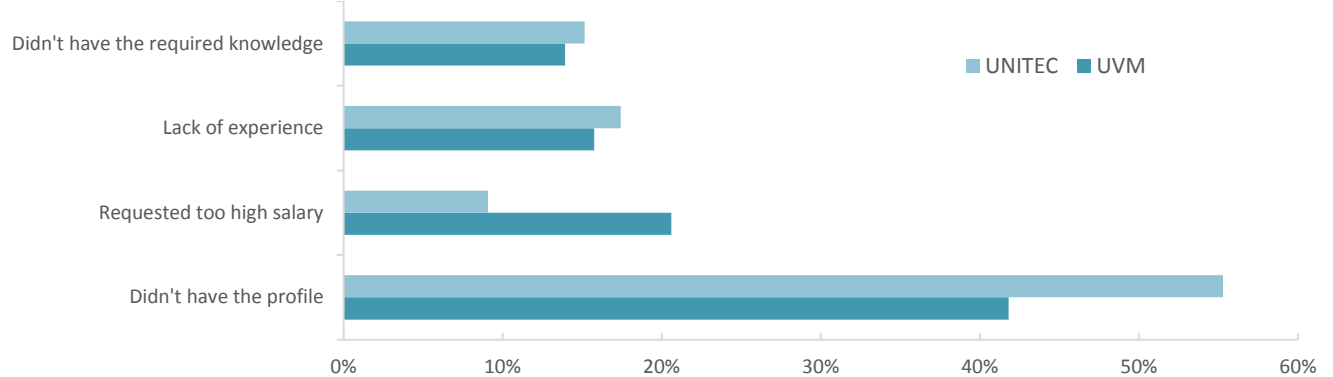
Percentage employers who have employed graduates, by type of university

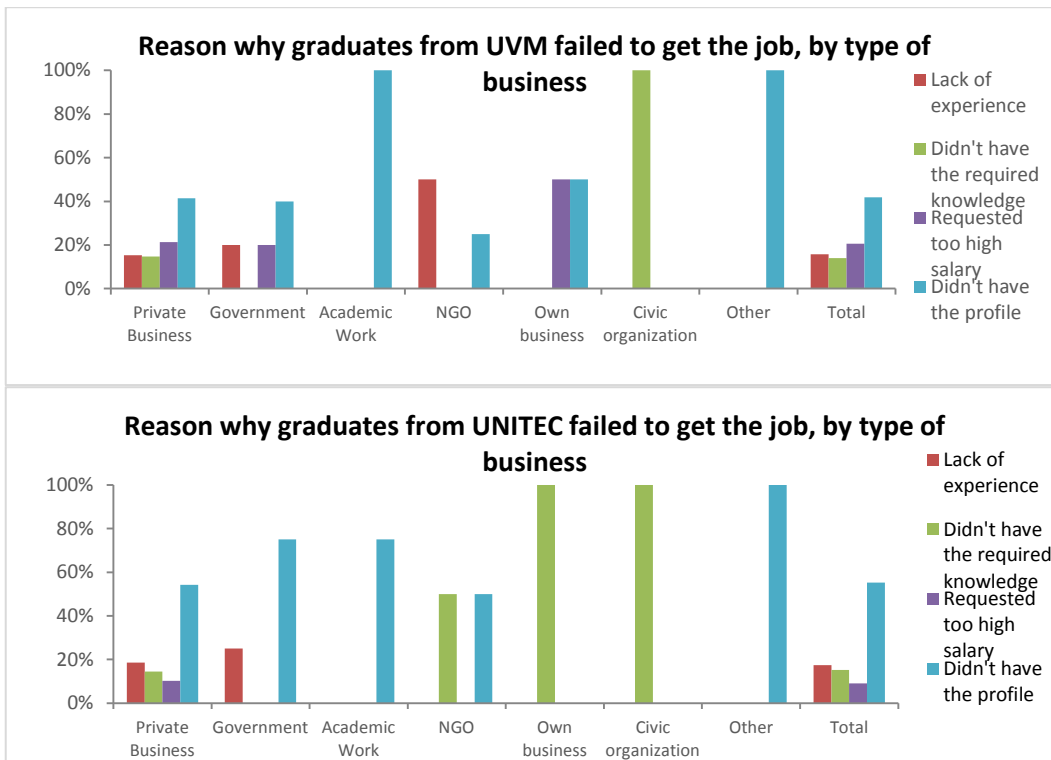


Percentage of companies where some Laureate applicants have failed to get the job, by type of business

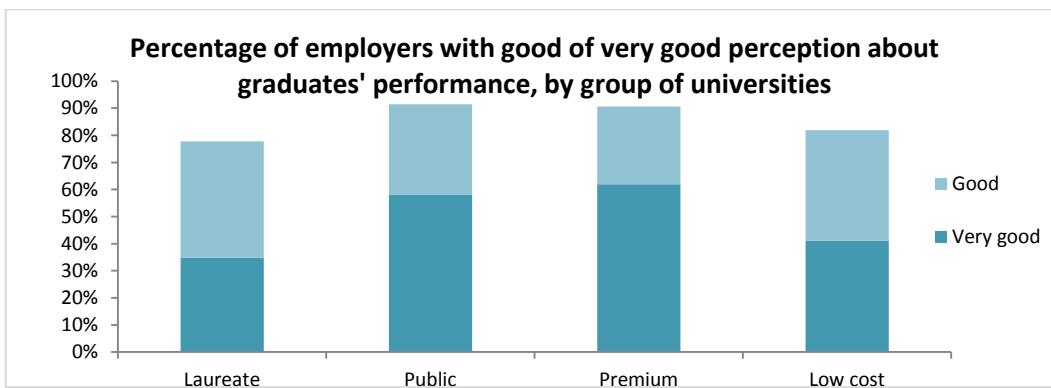


Reason why Laureate graduates failed to get the job, by university





ii. Satisfaction with Professional Performance



iii. Satisfaction with the Academic Profile of Employees

Perceived quality of skills, by university

