

2019-06-27

# An Investigation of Factors Related to Graduate Student Success

Nadi, Amr

---

Nadi, A. (2019). An Investigation of Factors Related to Graduate Student Success (Master's thesis, University of Calgary, Calgary, Canada). Retrieved from <https://prism.ucalgary.ca>.  
<http://hdl.handle.net/1880/110576>

*Downloaded from PRISM Repository, University of Calgary*

UNIVERSITY OF CALGARY

An Investigation of Factors Related to Graduate Student Success

by

Amr Nadi

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER OF ARTS

GRADUATE PROGRAM IN ECONOMICS

CALGARY, ALBERTA

JUNE, 2019

© Amr Nadi 2019

# Abstract

This thesis studies the factors that play a role in determining outcome variables related to MA or PHD degrees in Economics at the University of Calgary. Using a dataset constructed by digitizing the application folders of students who applied between 2006 and 2016, we investigate the relationships between the background/academic characteristics of applicants, and their likelihood of acceptance in the MA or PHD programs as well as their performance upon enrollment. Our main findings include that undergraduate GPA, ranking of the undergraduate university, the time since the student last attended an academic institution, whether the student attended a Canadian university, and whether the student previously attended UofC all affect the likelihood of acceptance. We find performance within the program to be related to gender, funding, undergraduate major, whether the student is enrolled in the course-based or thesis-based program, whether the student previously attended UofC, and the ranking of the undergraduate university.

# Table of Contents

Abstract . . . . .	ii
Table of Contents . . . . .	iii
List of Tables . . . . .	v
List of Figures . . . . .	vii
1 Introduction . . . . .	1
2 Literature Review . . . . .	3
2.1 Previous Studies . . . . .	3
2.2 Relationship to Existing Literature . . . . .	5
3 Data . . . . .	6
3.1 Data Collection & Curation . . . . .	6
3.2 Data Challenges . . . . .	8
3.3 Summary Statistics . . . . .	9
4 Methodology . . . . .	21
5 Results . . . . .	23
5.1 Acceptance . . . . .	23
5.1.1 MA Acceptance . . . . .	23
5.1.2 PHD Acceptance . . . . .	25
5.2 Enrollment . . . . .	26
5.2.1 MA Enrollment . . . . .	26
5.2.2 PHD Enrollment . . . . .	28

5.3	Program Completion . . . . .	29
5.3.1	MA Program Completion . . . . .	29
5.4	Grades . . . . .	32
5.4.1	MA Grades in Core Econ Courses . . . . .	32
5.5	Employment After Graduation . . . . .	33
5.5.1	MA Employment After Graduation . . . . .	34
6	Conclusion . . . . .	36
7	References . . . . .	38
8	Appendix . . . . .	41

# List of Tables

3.1	Sample Breakdown . . . . .	6
3.2	MA Accepted vs. Not Accepted . . . . .	9
3.3	PHD Accepted vs. Not Accepted . . . . .	16
3.4	MA Enrolled vs. Declined . . . . .	17
3.5	PHD Enrolled vs. Declined . . . . .	19
4.1	Summary of Variables . . . . .	22
5.1	Likelihood of Acceptance for MA Applicants . . . . .	24
5.2	Likelihood of Acceptance for PHD Applicants . . . . .	25
5.3	Likelihood of Enrollment for Accepted MA Applicants . . . . .	27
5.4	Likelihood of Enrollment for Accepted PHD Applicants . . . . .	29
5.5	Likelihood of Graduation for Enrolled MA Students . . . . .	30
5.6	Grades for MA Enrolled Students . . . . .	33
5.7	After Graduation Employment Outcomes for MA Graduates . . . . .	34
8.1	Funding Offered to Accepted MA Applicants . . . . .	41
8.2	Funding Offered to Accepted PHD Applicants . . . . .	42
8.3	Time Taken to Finish Program for Enrolled MA Students . . . . .	43
8.4	Time Taken to Finish Program for Enrolled PHD Students . . . . .	44
8.5	Time Taken to Find First Job After Graduating for MA Graduates . . . . .	45

8.6	Current (2019) Employment for Entire Sample . . . . .	46
8.7	Probit Regression Results . . . . .	47

# List of Figures and Illustrations

3.1	Mean Age . . . . .	10
3.2	Gender Distribution (%F) . . . . .	11
3.3	Distribution of Nationalities . . . . .	12
3.4	Undergrad University World Rank . . . . .	13
3.5	Mean GPA . . . . .	14
3.6	Mean Funding Offered . . . . .	15
3.7	MA Job Placement After Graduation . . . . .	19



# 1. Introduction

The decision to pursue graduate studies can be difficult. There are large costs associated with attending graduate school from the perspective of the student. From the perspective of the admissions committee, selecting students with the highest potential for success can also be a hard decision, especially given the increasing number of applicants over time.

This thesis attempts to answer some questions that can assist both the student and the admissions committee in making the best decisions with regards to application and admission. What are the factors that can increase the probability of being accepted into a graduate program? What are the variables that relate to performance in terms of grades and the likelihood of completing the program? Which MA students are more likely to pursue a PHD? What kind of jobs do MA graduates find after graduating, and how long does it take to find them?

To answer these questions, we assembled a dataset of 415 applicants to UofC's Department of Economics. Using Ordinary Least Squares (OLS) linear regressions, we provide correlation analyses between academic/background characteristics of applicants and dependent variables such as acceptance, grades, program completion, and job placement. We find that the factors related to acceptance to MA and PHD programs at UofC include GPA, the time since the student was last enrolled at an academic institution, the ranking of the undergraduate university, whether the university was Canadian, and whether the student was a previous UofC graduate.

We find that the variables related to student performance within the program and program completion are gender, whether the student previously attended UofC, the ranking of the undergraduate university, the undergraduate major of the student, and the funding offered.

Finally, we find that the factors related to job placement are gender, age, whether the student attended a Canadian University during undergraduate study, the undergraduate major, and again, the funding offered. We also find that thesis-based MA students are more likely to pursue a PHD while females are less likely to do so.

The rest of the thesis is organized as follows: Chapter 2 summarizes the most relevant literature and discusses the relationship to this thesis. Chapter 3 explains the data collection and data entry process and provides summary statistics and analysis of the sample. Chapter 4 discusses the methodology used, while Chapter 5 presents and analyzes the regression results. Chapter 6 concludes.

## 2. Literature Review

This chapter summarizes the relevant literature and discusses the similarities and differences between this thesis and other related studies.

### 2.1 Previous Studies

A large literature has attempted to answer questions related to graduate student success. However, the definition of success varies across the different studies. Some looked at just program completion; some looked at the grades and GPA obtained within the program; and some looked at job placement after graduation.

Hansen (1971) used data from the University of Wisconsin to predict the GPA of enrolled students in the Masters of Economics program. He found that GRE scores, undergraduate GPA, and an index number which reflects the quality of the undergraduate university are all good predictors of GPA but explain only 23% of the variation. This thesis does not use graduate GPA as an outcome variable as it was not recorded. However, we also find that undergraduate GPA and university quality both have significant effects but on the likelihood of acceptance to the graduate program as well as the likelihood of enrollment upon acceptance.

Decker (1973) defined success as the ability to complete a PHD program in Economics. Using data collected from the University of Berkeley, he found that the quality of the undergraduate university is positively related to program completion. He found that females, as well as students who were undergraduates at Berkeley, are more likely to drop out of the program. He also found

that having an MA degree prior to being enrolled in the PHD program is not a significant variable regarding program completion. His last main finding was that students who enter program immediately after their undergraduate training have average success rate. Those who wait 1-2 years have above average success rate, and those who wait for more have below average success rate.

Wright (1964) also defined success as the ability to complete the program in Economics and found that a PHD student who came from a non-American university, a student who already had an MA, older students, and students whose father had a low status occupation were all more likely to drop out. Wright also tested for non-academic factors such as the social attitudes of the student. He found that PHD students who thought of their faculty as indifferent or uninterested in the student's work were more likely to fail and that students who viewed their classmates as close friends were more likely to succeed in their programs as opposed to students who consider their classmates as just classmates.

The findings of this thesis have some similarities to those of Decker and Wright. Like Decker's, this study finds that females are significantly more likely to drop out. It also finds a significant effect for UofC undergraduates who enrolled in the MA program. However, the direction of the effect is opposite to what Decker found. We find that UofC graduates are more likely to complete the program. In comparison to Wright's findings, we do not find any effect for coming from a non-Canadian university on program completion.

Also unlike Wright's finding, Gertler & Meltzer (1970) found that having an MA prior to enrolling in the PHD program actually increases the likelihood of success. However, their measure of success was an index which captured the number of published papers after graduation and the quality of the journals they were published in. They also conclude that undergraduate GPA has a positive effect on students' success and that GRE scores do not have any significant effect.

Other studies investigated the effects of students' relationships with their supervisors. Hesli et. al (2006), Arguinis et. al (1996), as well as Wright (1964) all find that good relationships with supervisors as perceived by the student increase the likelihood of program completion. Hesli

et. al also find that married students are more likely to complete a PHD in political science once enrolled. They also find that Political Science departments which had too much emphasis on research methodology had a negative effect on their program completion rate. As interesting as these variables are, they are not captured by our dataset and we cannot compare results.

The last two studies we discuss here both looked at success beyond the graduate program and recorded graduates' jobs after program completion. Krueger & Wu (2000) found that GRE scores and the prominence of the reference writer for the student both serve as good predictors of job placement. Athey et. al (2007) find that grades in core Economics courses affect job placement. They also find that GRE scores, undergraduate university world ranking, and having a previous MA all positively affect grades in the core Economics courses. In this thesis we did not capture neither GRE nor prominence of referee writers as variables. However, we do include having a previous MA and the undergraduate university world ranking. Like Athey et. al, we also find that the ranking of the undergraduate university has a positive effect on grades. However, we do not find that grades have any effect on job placement.

## 2.2 Relationship to Existing Literature

Given the available data, our study combines the various measures of success used by the previous studies. We use program completion, grades in core courses, and job placement all as dependent variables. In addition, we test for the variables that can predict acceptance to the graduate program, as well as the probability that the accepted student will not decline the offer. Other studies used GRE scores, prominence of referee writers, and relationships with supervisors and classmates as independent variables. Unfortunately, these variables are not captured in the dataset we use.

The novelty of this thesis comes in the original dataset compiled from the application files at University of Calgary's Department of Economics. Furthermore, the use of LinkedIn.com to record job placement is also a new method as previous studies have used telephone directories to record job placement.

## 3. Data

This chapter explains our data collection and data entry process, provides summary statistics, and discusses the challenges posed by the data.

### 3.1 Data Collection & Curation

We obtained the data in the form of hard copy files kept by the Department of Economics at University of Calgary. These files contained information for students who applied to either MA or PHD programs between 2006 and 2016. Among those were students who were accepted and enrolled, accepted but declined the offer, and not accepted at all<sup>1</sup>.

Table 3.1: Sample Breakdown

	MA	PHD	Total
<b>Accepted</b>	229	60	289
<b>Enrolled</b>	130	35	165
<b>Declined</b>	99	25	124
<b>Not Accepted</b>	28	98	126
<b>Total</b>	257	158	415

Table 3.1 presents the sample distribution. The total sample size is 415 observations. Among those are 257 MA applicants and 158 PHD applicants. Among the MA applicants, 229 were accepted and 28 were not accepted. Among the accepted MA applicants, 130 accepted UofC's offer and 99 declined. Among the 158 PHD applicants, 60 were accepted and 99 were not. Among the accepted PHD applicants, 35 accepted UofC's offer and 25 declined. It is important to note

---

<sup>1</sup>Note: The dataset has been de-identified and never included any students who are currently enrolled.

that the dataset may not reflect the true number of applicants as it is likely that the Department disposed of some files. The Data Challenges section further discusses this issue.

Each of the application files contained information about the student's background characteristics such as their age at the time of application, gender, nationality, and visa status in Canada. The files also contained academic information such as the student's university of undergraduate study, university of previous graduate study for PHD students, major, and GPA on a 4.0 scale. The files also contained the student's last date of graduation from an academic institution, which allowed us to generate the variable "freshness of mind", which captures the time since the student was last enrolled at an academic institution. If the student was accepted, their file also contained the amount of funding offered.

For students who were enrolled, their files included their grades in the core Economics courses as well as the time taken to complete the program, which was calculated by subtracting the date of admission from the date of graduation. If a student withdrew from the program, their file included their form and date of withdrawal.

Besides the information contained in these files, we collected additional information from LinkedIn.com. About 60% of the total sample had LinkedIn accounts that included their job title and organization of employment. For students who were enrolled and graduated, LinkedIn allowed capturing their job after graduating, the time it took them to find that job, as well as their current 2019 position and organization of employment.

LinkedIn was also useful for gathering information about the students who were not enrolled. We recorded whether the student pursued their degree at another institution, as well as the name of that institution. We also recorded their current job title and organization of employment.

We organized and curated the dataset after entering the data. Variables such as the university of study and the current job title and organization of employment were particularly tricky to deal with, given that almost each observation comes with a different value for these variables.

The most objective way to deal with the university variables was to record the university's

world ranking. We gathered information about university rankings from the Webometrics Ranking of World Universities which is an initiative of the Cybermetrics Lab, a research group belonging to the Consejo Superior de Investigaciones Cientificas (CSIC), the largest public research body in Spain<sup>2</sup>. We then represented this ranking as a ratio of the total number of ranked universities worldwide. It therefore takes value between 0 and 1, where a better university would take value closer to 0.

For employment outcomes, we recorded both the job position and the type of organization. We categorized job position into 4 categories: "Student", "Analyst", "Low Level", and "Medium/High Level". MA students who continued in PHD belonged to the category "Student". The job title "Analyst" was very frequent and therefore received a category on its own. Job titles such as "Customer Service" or "Front Desk Receptionist" belonged to the category "Low Level". Job titles such as "Manager" or "Team Leader" belonged to the category "Medium/ High Level".

We also separated the type of organization the job was at into 4 categories: "Academic", which mainly includes those who continued in PHD, "Banking", "Government", and "Private". "Banking" includes any type of bank or financial firm. "Government" includes any type of Canadian government agency. "Private" includes small businesses and multinational private companies.

### 3.2 Data Challenges

There are challenges arising from the nature of the data. The most obvious is the small size of the sample, especially when divided into the different sub-samples of accepted students, not accepted students, etc. Another issue is that the number of files found for the different years does not reflect the true number of students who applied in a given year. It seems that the department disposed of many of the files for students who were not enrolled. This may give rise to the prospect of sample selection bias since it is not clear if the files that were kept are special in any way. It also decreases the reliability of results produced from tests regarding the likelihood of acceptance in the graduate

---

<sup>2</sup><http://www.webometrics.info/en>



program since the sample of all applicants is not entirely representative of the true population. However, the sample of students who were enrolled is a more or less accurate representation of the students who actually were enrolled.

Another challenge is missing data. Besides the fact that not all of the sample had LinkedIn accounts (which in itself could be some indicator of pro-activity), and therefore no information for employment outcomes was recorded, many of the files had missing information. This further reduced the size of the samples used in the regression analyses done later as only observations with full information could be included.

### 3.3 Summary Statistics

Table 3.2 compares summary statistics for the variables measured for MA students who were accepted and MA students who were not accepted. The mean age for the entire sample of MA applicants is 25 years. However, both Table 3.2 and Figure 3.1 show that those accepted tend to be younger than those not accepted by about 1 year.

Table 3.2: MA Accepted vs. Not Accepted

	All MA	MA Accepted	MA Not Accepted
<b>Age at Application</b>	25.21 (4.58)	25.13 (4.62)	26.37 (3.86)
<b>Gender (% F)</b>	46%	46%	43%
<b>Nationality</b>			
<i>North America</i>	32%	36%	4%
<i>China</i>	30%	30%	29%
<i>India/Bangladesh/Pakistan</i>	12%	11%	21%
<i>Africa</i>	6%	3%	25%
<i>Other</i>	14%	13%	21%
<b>Undergrad World Rank</b>	0.10 (0.20)	0.10 (0.20)	0.16 (0.20)
<b>Canadian University</b>	58%	62%	29%
<b>UofC Undergrad</b>	22%	24%	4%
<b>Non-Econ Major</b>	14%	13%	29%
<b>GPA (4.0 Scale)</b>	3.50 (0.34)	3.54 (0.32)	3.17 (0.37)
<b>Freshness of Mind (Years)</b>	0.99 (2.15)	0.87 (2.02)	1.89 (2.80)
<b>Funding Offered (CAD)</b>	-	10,706 (16,447)	-
<b># of Observations</b>	257	229	28

Note: Values displayed for numeric variables are the mean and the standard deviation in parentheses. Categories for nationality may do not add up to 100 due to missing data.

Figure 3.1: Mean Age

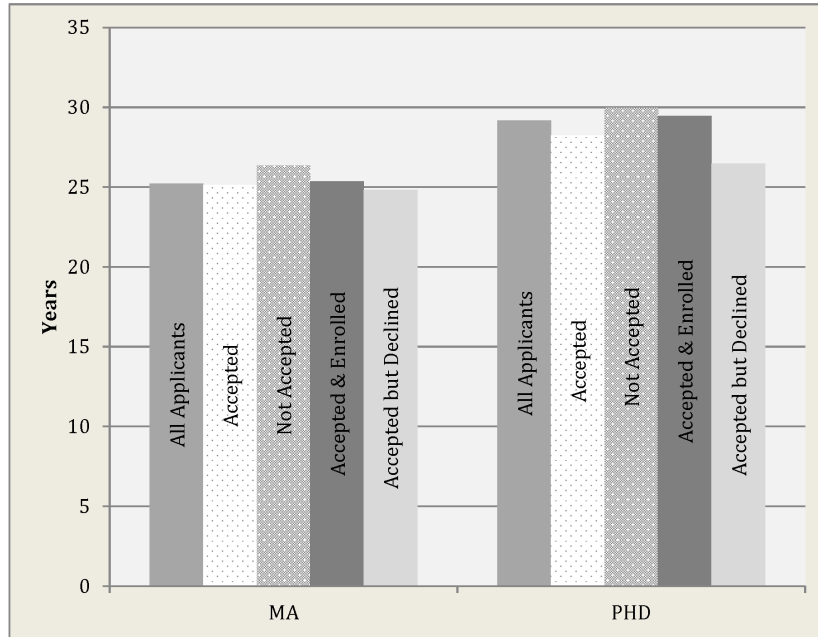
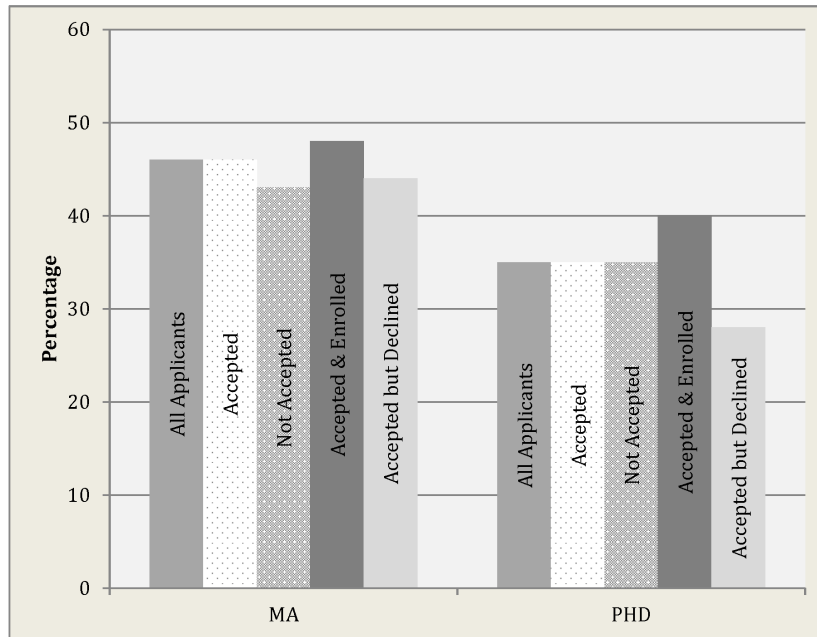
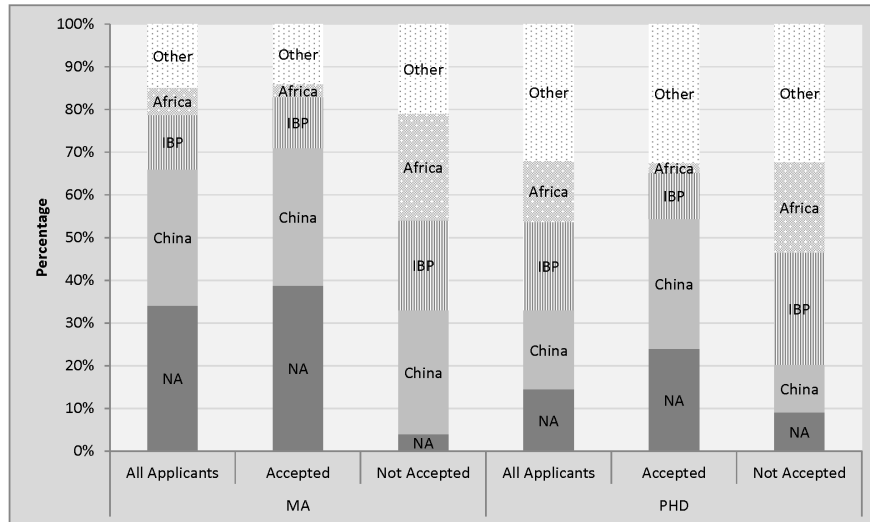


Figure 3.2: Gender Distribution (%F)



As Table 3.2 and Figure 3.2 show, females account for 45% of all MA applicants. This ratio is maintained across those accepted and those not accepted, which is a strong sign that there is no bias regarding gender when accepting students. An interesting point not shown in the table is that the majority of these women are foreign. Canadian women account for only 11% of all MA applicants, and all of these Canadian women were accepted.

Figure 3.3: Distribution of Nationalities



We encoded the variable nationality in a way that combines countries with similar cultural characteristics together for the purpose of increasing the number of observations under each category. The category North America mostly contains Canadian students with only a few observations that come from the U.S or Mexico. Due to the large number of Chinese applicants, China took a separate category. As can be seen in Table 3.2 and Figure 3.3, the majority of applicants and accepted students comes from North America and China. Figure 3.3 shows signs that North American students are more likely to be accepted and that African students are more likely to be rejected. We later explore and discuss this notion in the Results section.

The variable undergrad world rank is the university's world rank taken as a ratio from the total number of ranked universities. The average applicant comes from a university that is ranked in the top 10% in the world. Figure 3.4 shows that those who come from higher ranked universities seem more likely to be accepted as the mean university ranking for those not accepted is significantly

lower than that for those who were accepted.

Figure 3.4: Undergrad University World Rank

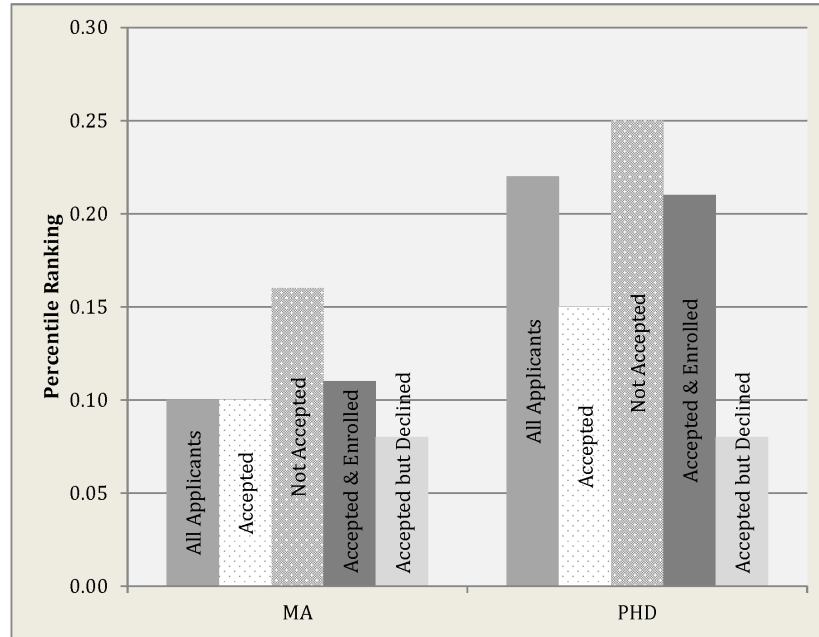
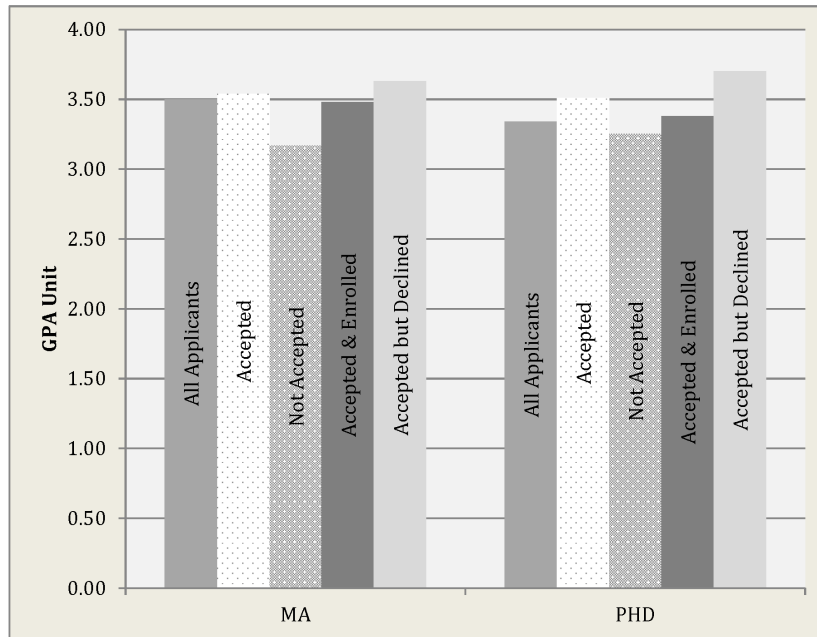


Table 3.2 shows that almost 60% of MA applicants come from Canadian universities. A third of those come from University of Calgary. The rest come from international universities. Fourteen percent of applicants are non-economics majors and maintain that share across the accepted sample.

The summary statistics and Figure 3.5 present a strong indication that GPA is an important factor regarding admission. The mean GPA for all MA applicants is 3.5. The mean GPA for those accepted is 3.54 and much lower at 3.17 for those who were not accepted.

The variable "freshness of mind" represents the number of years since the student last graduated from an academic institution. The average applicant waits for about 1 year before applying to graduate school after graduating. There is an indication that this could be an important variable in determining acceptance since those accepted tend to wait for less time before applying compared

Figure 3.5: Mean GPA



to those not accepted. However, since there are a few outliers that skew the distribution, we later converted this variable into a dummy that takes value 1 if the student applied to the program immediately after their graduation and 0 otherwise.

One of the other important variables we captured is the funding offered to accepted students. This is the funding that was promised to the student on their letter of acceptance. For MA students, it is usually over a period of 1 year. However, some students are offered a higher amount but over a longer time period. The value recorded does not take this into account. Also, for those enrolled, the true amount they received may be higher than that promised. The values used here simply represent the amount the student knows they are guaranteed to receive. Figure 3.6 shows the distribution. The mean funding offered to an accepted MA applicant is about 10,700 CAD.

Figure 3.6: Mean Funding Offered

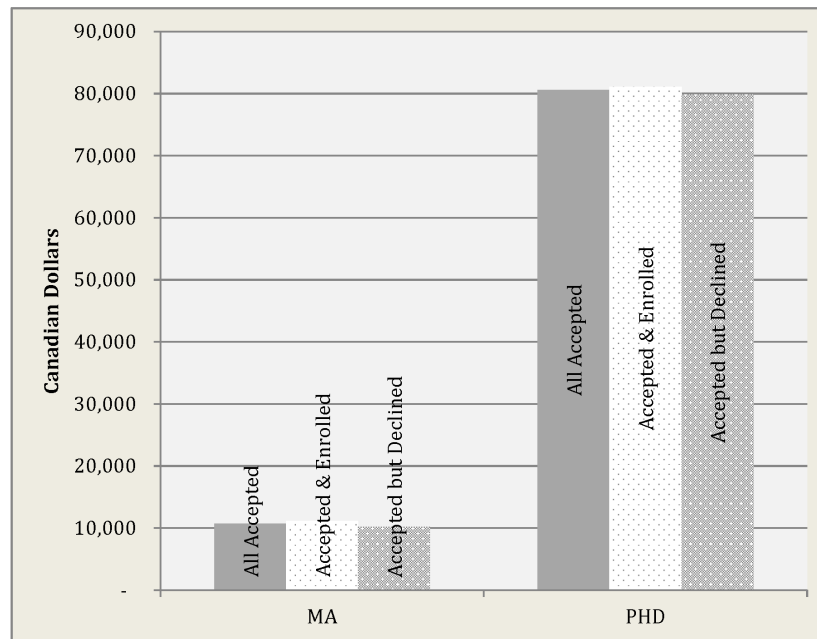


Table 3.3 describes the PHD data, presenting the same variables previously discussed in addition to the PHD applicant's university of previous graduate study. Most of comparisons for the variables are similar to those found for the MA sample. Accepted PHD students tend to be younger than those not accepted. The age of the average PHD applicant is about 29 years. The percentage of females who apply for PHD is lower than that for MA at 35%. The percentage of Canadian females is very low at 2% of all PHD applicants. Regarding nationalities, the majority of PHD applicants come from India, Pakistan, Bangladesh, and China. The percentage of Canadian/North American PHD applicants is relatively low at 14%.

The average PHD applicant comes from an undergraduate university ranked in the top 22% worldwide. Figure 3.4 shows that those who come from higher ranked undergrad universities seem more likely to be accepted. The average undergraduate GPA for PHD applicants is 3.34. As Figure 3.5 shows, those with higher GPAs also seem more likely to be accepted.

Table 3.3: PHD Accepted vs. Not Accepted

	All PHD	PHD Accepted	PHD Not Accepted
<b>Age at Application</b>	29.16 (5.62)	28.24 (5.70)	29.96 (5.47)
<b>Gender (% F)</b>	35%	35%	35%
<b>Nationality</b>			
<i>North America</i>	14%	22%	9%
<i>China</i>	18%	28%	11%
<i>India/Bangladesh/Pakistan</i>	20%	10%	26%
<i>Africa</i>	14%	2%	21%
<i>Other</i>	31%	30%	32%
<b>Undergrad World Rank</b>	0.22 (0.30)	0.15 (0.27)	0.25 (0.31)
<b>Canadian University</b>	24%	47%	10%
<b>UofC Undergrad</b>	4%	7%	2%
<b>GPA (4.0 Scale)</b>	3.34 (0.43)	3.51 (0.38)	3.25 (0.43)
<b>Grad World Rank</b>	0.09 (0.18)	0.03 (0.05)	0.13 (0.22)
<b>UofC Grad</b>	7%	13%	3%
<b>Freshness of Mind (Years)</b>	1.94 (3.01)	0.98 (1.31)	2.52 (3.57)
<b>Funding Offered (CAD)</b>	-	80,603 (34,921)	-
<b># of Observations</b>	158	60	98

Note: Values displayed for numeric variables are the mean and the standard deviation in parentheses. Categories for nationality may do not add up to 100 due to missing data.

Regarding PHDs' previous graduate study, applicants tend to come from programs at highly ranked universities. The average graduate university ranking for a PHD applicant is in the top 9% worldwide. Those accepted on average come from graduate programs at universities in the top 3% worldwide, indicating that the quality of the previous graduate program is critical to admission.

Students who completed their MA degree at UofC represent 7% of the total PHD applicant sample. For freshness of mind, the average PHD applicant appears to wait for about 2 years after completion of their last degree and before applying to the PHD program. Those with fresher minds seem to be more likely to get accepted as there is a relatively big difference between the means for the Accepted and Not Accepted PHD samples; however these means are inflated due to the existence of a few outliers.

As previously noted, the variable "funding offered" is the total funding promised to the student on their letter of acceptance. For PHDs, this funding is usually over a period of 4 years. The mean funding offered to an accepted PHD student is 80,603 CAD.

Focusing on the sample of accepted students, Tables 3.4 and 3.5 compare the statistics between those who accepted the offer and were enrolled and those who declined the offer for the MA and PHD samples respectively. The tables present summary statistics for the relevant variables



presented in the previous tables and additional variables related to performance within the program, and job placement after graduation for MA graduates.

Table 3.4: MA Enrolled vs. Declined

	MA Enrolled	MA Declined
<b>Age at Application</b>	25.36 (4.41)	24.83 (4.88)
<b>Undergrad World Rank</b>	0.11 (0.24)	0.08 (0.12)
<b>UofC Undergrad</b>	36%	8%
<b>GPA (4.0 Scale)</b>	3.48 (0.31)	3.63 (0.31)
<b>Freshness of Mind (Years)</b>	1.04 (1.78)	0.67 (2.26)
<b>Funding Offered (CAD)</b>	11,152 (17,983)	10,138 (14,326)
<b>Graduated</b>	92%	-
<b>Time Taken to Finish Program (Months)</b>	21.95 (9.66)	-
<b>Time Taken to Find Job After Graduation (Months)</b>	2.90 (4.31)	-
<b>After Graduation Position Type</b>		
<i>Student</i>	11%	-
<i>Analyst</i>	34%	-
<i>High/Medium Level</i>	41%	-
<i>Low Level</i>	14%	-
<b>After Graduation Organization Type</b>		
<i>Academic</i>	14%	-
<i>Banking</i>	21%	-
<i>Government</i>	25%	-
<i>Private</i>	40%	-
<b>Got MA Elsewhere</b>	-	90%
<b>Other MA University World Rank</b>	-	139 (131)
<b># of Observations</b>	130	99

Note: Values displayed for numeric variables are the mean and the standard deviation in parentheses. The percentages displayed for employment-related variables are calculated using the sample of the 73 MA graduates who have LinkedIn accounts.

Before discussing the statistics, we should make note about the nature of the sample. We can infer that the sample of students who declined UofC's offer are a sample of higher quality students by nature. This is because those who declined are most likely to have multiple offers from different universities, therefore putting them in a position where they can decline UofC's offer and pursue their degree elsewhere.

Table 3.4 shows that MA students who decline the offer tend to be younger. They also tend to come from higher ranked universities, have higher GPA's, and have "fresher" minds. Unsurprisingly, the mean funding for those who decline is lower than that for those accepted, indicating that they might have pursued their degree elsewhere at an institution which offered more funding.

Ninety percent of those who declined and have LinkedIn accounts pursued their MA elsewhere at a university ranked 139th worldwide on average (which is lower than University of Calgary's

world ranking of 108). Although not presented in the Table, it is worthwhile to note that the most frequent university that those who decline University of Calgary's offer go to is University of Toronto.

Table 3.4 also presents information pertaining to those who were enrolled in the MA program. Ninety-two percent of enrolled MA students graduated from the program, while the rest either dropped out or were forced to withdraw due to poor performance. The average MA student takes about 22 months to complete the program. However this average is calculated using both course-based and thesis-based students who tend to take more time due to the nature of their program.

All the numbers regarding employment and the time taken to find a job were calculated using the sample of the 73 MA graduates who had LinkedIn accounts. Upon graduating, it takes an MA student an average of 3 months to find a job.

Regarding job placement after graduation for these MAs, only 11% of MA graduates (who have LinkedIn accounts) continued in a PHD program. Thirty-four percent found jobs with the title "Analyst". Forty-one percent found High/Medium level jobs, and 14% found low level jobs.

Figure 3.7 shows the type of organization that MA graduates worked at after graduating. Fourteen percent worked at an academic institution. This 14% includes the 11% who continued in PHD and an additional 3% who worked as staff at an academic institution. Twenty-one percent went into the banking sector. Twenty-five percent worked at a Canadian government agency, and 40% worked at a privately owned company.

Figure 3.7: MA Job Placement After Graduation

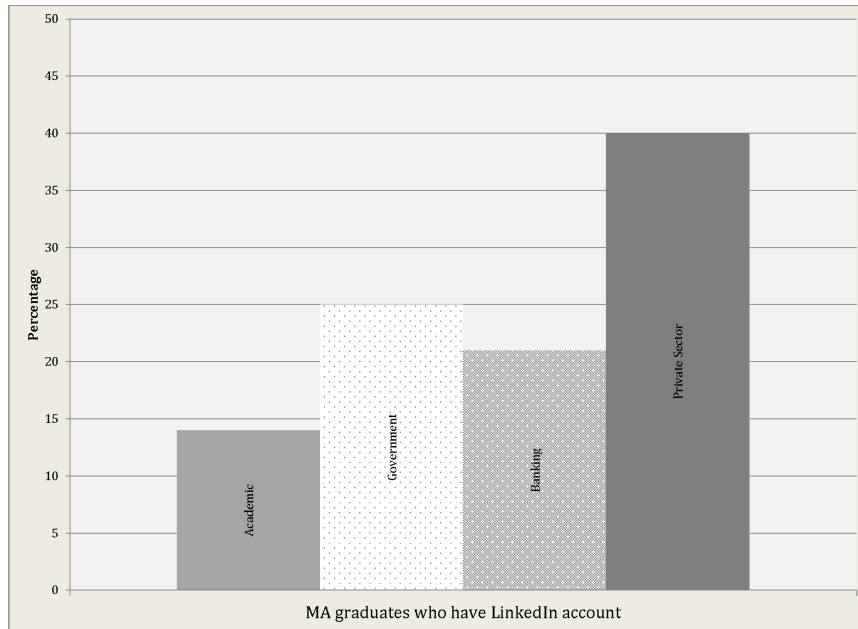


Table 3.5 presents the same comparisons for PHD students but without the employment outcomes due to the limited data available. The same conclusions apply with regards to age, GPA, undergraduate and graduate university world ranking, freshness of mind, and funding offered.

Table 3.5: PHD Enrolled vs. Declined

	PHD Enrolled	PHD Declined
<b>Age at Application</b>	29.46 (6.62)	26.46 (3.43)
<b>Undergrad World Rank</b>	0.21 (0.33)	0.08 (0.15)
<b>GPA (4.0 Scale)</b>	3.38 (0.35)	3.70 (0.34)
<b>Grad World Rank</b>	0.04 (0.06)	0.02 (0.03)
<b>UofC Grad</b>	17%	8%
<b>Freshness of Mind (Years)</b>	1.15 (1.52)	0.76 (0.93)
<b>Funding Offered (CAD)</b>	81,111 (29,062)	79,818 (43,193)
<b>Graduated</b>	63%	-
<b>Time Taken to Finish Program (Months)</b>	71.39 (27.62)	-
<b>Got PHD Elsewhere</b>	-	59%
<b>Other PHD University World Rank</b>	-	92 (52)
<b># of Observations</b>	35	25

Note: Values displayed for numeric variables are the mean and the standard deviation in parentheses.

Among those who declined, and who have a LinkedIn account, 58% pursued their PHD else-

where. The mean world ranking for the other PHD university is 92; meaning that it is ranked 17 positions higher than University of Calgary. It is interesting that MA applicants who decline the offer on average go to a lower ranked university compared to UofC; while their PHD counterparts go to a much higher ranked university. This could imply that perhaps MA students are driven by funding or proximity while PHD students are driven by ranking and reputation . However, again, the sample size is too small to strongly support these conclusions.

The PHD program completion rate is 63%, which is a lot lower than that of MA. For those who graduated, the average time it took them to complete the program was about 72 months.

## 4. Methodology

The main method we used in this study was Ordinary Least Squares (OLS) regression analysis. We ran linear regressions with different specifications on each of the dependent variables of interest. Each specification keeps adding one independent variable at a time. The goal of these exercises was to maximize the value of the adjusted R-squared, which reflects the predictive power of all the independent variables combined.

We later performed the same tests using a Probit model. The model produced similar results to those from the OLS regressions. We however preferred to use OLS as our main method of analysis for the simplicity and clarity of interpretation. Another reason for using OLS was that the Probit model eliminates large numbers of observations from the analysis since it considers some of the independent variables to be perfect predictors of the dependent variables. This problem is known as the "rare outcome" problem. Table 8.6 in the Appendix shows the results for the successful Probit models. All the tables found in the Results section are those resulting from our OLS regressions.

Table 4.1 summarizes the main dependent and independent variables included as well as the samples used in testing for each of the dependent variables.

The first dependent variable of interest is the likelihood of acceptance. We tested for MA and PHD applicants separately using the total sample of applicants. After that, we narrowed our focus down to only those accepted in order to study the second dependent variable of interest, the likelihood of not declining UofC's offer.

The third dependent variable is the probability of program completion, or in other words, the probability that the student will not drop out. The tests associated with this variable include only

Table 4.1: Summary of Variables

<b>Dependent Variables</b>	<b>Sample Used</b>	<b>Independent Variables</b>
Acceptance to Graduate Program	All Applicants	Age
Enrollment Upon Acceptance	Accepted Applicants	Gender
Program Completion	Enrolled Students	Nationality
Grades in Core Econ Courses	Graduated Students	Undergraduate University World Rank
Employment Outcomes After Graduation	Graduated Students	Canadian University
		UofC Undergrad
		Non-Econ Major
		Undergraduate GPA
		Fresh Grad
		Graduate University World Rank
		UofC MA Graduate
		Funding Offered
		Thesis-Based

those who accepted UofC’s offer and were enrolled in the program. Again, this analysis is done separately for MA and PHD samples.

The final two dependent variables focus only on graduated MA students due to the small sample size of graduated PHD students for whom data is available. We show the results for grades in the ECON core courses for MA students as well as the employment outcomes for MA students immediately after their graduation.

The number of observations used in the regression analyses may differ than those shown in Table 3.1, which showed the sample distribution. This is because the observations used in the regression analyses were only those which had data for all of the variables included in the tests. We dropped all observations with missing data from the analysis.

It is important to note that this thesis does not attempt to make any claims of causality. Our goal is to detect robust patterns for the different variables included and to discover some existing correlations.

## 5. Results

### 5.1 Acceptance

The first step of the analysis is to determine which applicants are more likely to be accepted in their program of application. The variable "Accepted" takes value 1 if the student was accepted and 0 if not. Tables 5.1 and 5.2 show the results for MA and PHD applicants respectively.

#### 5.1.1 MA Acceptance

The first and second specifications shown in Table 5.1 imply that if a student is older than the mean age by 1 year, they are 1.5% less likely to be accepted. However, the statistical significance of this result disappears as more variables are included.

There is a robust negative coefficient for the nationality "Africa". It appears that even after accounting for all the variables measured in this study, African students are 31% less likely to be accepted. The result is of statistical significance at the 5% level.

African students come on average from a university ranked 10 percentage points worse than the average ranking for all applicants. Although we do control for the university ranking, we do not account for some of the non-measurable aspects of coming from a poor university. An applicant from a poor university is more likely to write a poor essay and have badly written reference letters. As we point out again later, we suspect that essays and reference letters play a large role in explaining the variation in acceptance that was unexplained by our model. It is therefore very likely that African students are rejected not because of them purely being African, but because

Table 5.1: Likelihood of Acceptance for MA Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age at Application	<b>-0.0154**</b> (-2.83)	<b>-0.0154**</b> (-2.82)	-0.00889 (-1.62)	-0.00840 (-1.51)	-0.00870 (-1.56)	-0.00884 (-1.57)	-0.00798 (-1.32)	-0.00658 (-1.10)	-0.00587 (-0.99)	-0.00585 (-0.98)
Female		-0.0128 (-0.31)	-0.0243 (-0.62)	-0.0237 (-0.60)	-0.0241 (-0.61)	-0.0267 (-0.66)	-0.0256 (-0.63)	-0.0247 (-0.62)	-0.0360 (-0.90)	-0.0351 (-0.87)
Africa			<b>-0.389**</b> (-3.29)	<b>-0.375**</b> (-3.13)	<b>-0.357**</b> (-2.89)	<b>-0.357**</b> (-2.89)	<b>-0.356**</b> (-2.87)	<b>-0.328**</b> (-2.67)	<b>-0.311**</b> (-2.54)	<b>-0.309**</b> (-2.52)
North America			0.000240 (0.00)	0.00588 (0.06)	-0.00755 (-0.07)	-0.00628 (-0.06)	-0.00349 (-0.03)	0.0241 (0.23)	0.00515 (0.05)	0.00579 (0.06)
China			-0.0268 (-0.26)	-0.0244 (-0.24)	-0.0191 (-0.18)	-0.0196 (-0.19)	-0.0154 (-0.15)	0.00983 (0.09)	-0.0159 (-0.15)	-0.0173 (-0.17)
India/Bangladesh/Pakistan			-0.163 (-1.51)	-0.142 (-1.27)	-0.126 (-1.10)	-0.128 (-1.11)	-0.129 (-1.12)	-0.103 (-0.90)	-0.101 (-0.89)	-0.101 (-0.89)
Other Country			-0.0200 (-0.18)	-0.0153 (-0.14)	-0.00980 (-0.09)	-0.0105 (-0.09)	-0.0102 (-0.09)	0.00605 (0.05)	0.00265 (0.02)	0.000803 (0.01)
Undergrad Uni World Rank				-0.0778 (-0.68)	-0.0594 (-0.51)	-0.0501 (-0.42)	-0.0459 (-0.38)	-0.0412 (-0.35)	-0.00560 (-0.05)	-0.00234 (-0.02)
Canadian University					0.0363 (0.67)	0.0259 (0.43)	0.0226 (0.37)	0.0410 (0.68)	0.0296 (0.49)	0.0292 (0.48)
UofC Undergrad						0.0207 (0.39)	0.0213 (0.40)	0.0184 (0.35)	0.0363 (0.69)	0.0365 (0.69)
Non-Econ Major							-0.0250 (-0.39)	-0.00523 (-0.08)	0.00899 (0.14)	0.00687 (0.11)
Undergrad GPA								<b>0.141**</b> (2.30)	<b>0.125**</b> (2.03)	<b>0.124**</b> (2.02)
Fresh Grad									<b>0.0800*</b> (1.77)	<b>0.0801*</b> (1.77)
Thesis-Based										-0.0127 (-0.24)
Observations	154	154	154	154	154	154	154	154	154	154
Adjusted R-squared	0.044	0.038	0.181	0.178	0.175	0.170	0.165	0.190	0.202	0.197

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05

Coefficients for country are all relative to the category "Missing"

their applications are usually accompanied with poor essays and poor references.

GPA appears to be an important variable affecting the likelihood of acceptance. The coefficient for GPA is statistically significant at the 5% level; where if a student's undergraduate GPA moves from 3.0 to 4.0, they become 13% more likely to be accepted in the MA program.

The last variable which produced significant results was "Fresh Grad". This variable takes value 1 if the student applied to the MA program in the same year they graduated from another program at an academic institution, and 0 otherwise. If a student is "fresh", they are 8% more likely to be accepted in the MA program compared to a student who is not.

There are no significant results for any of the other variables included. Overall, the final specification of the model explains only 20% of the variation in acceptance, as shown by the Adjusted R-squared values. It is well known that a huge part of the acceptance decision relies on the essay the student wrote and on the reference letters submitted. These variables that could not be captured



in the study but are likely to be playing a big role in explaining the remaining 80% of the variation in MA acceptance.

### 5.1.2 PHD Acceptance

The tests for PHD acceptance produced different results than those done for MA applicants. Age did not seem to be an important factor at all, and neither did "fresh grad". The negative coefficient for Africa as a nationality remained. However, the statistical significance of the coefficient disappeared as more variables were included. GPA still remained an important, statistically significant variable, where if a PHD applicant's GPA moves from 3.0 to 4.0, they become 28% more likely to be accepted. In addition to GPA, the world rank of the applicant's university of graduate study

Table 5.2: Likelihood of Acceptance for PHD Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age at Application	-0.00309 (-0.30)	-0.00246 (-0.23)	-0.00303 (-0.30)	-0.00327 (-0.33)	-0.00564 (-0.60)	-0.00482 (-0.51)	-0.00468 (-0.49)	-0.00837 (-0.91)	-0.0112 (-1.19)	-0.0115 (1.26)	-0.0104 (1.11)
Female		-0.0377 (-0.28)	-0.0263 (0.19)	0.0535 (0.39)	0.0937 (0.73)	0.0106 (0.83)	0.0104 (0.79)	0.0829 (0.66)	0.0551 (0.44)	0.134 (0.61)	0.134 (1.43)
Africa			<b>-0.931*</b> <b>(-1.91)</b>	<b>-0.887*</b> <b>(-1.82)</b>	-0.223 (-0.45)	-0.220 (-0.44)	-0.239 (-0.46)	-0.207 (-0.42)	-0.328 (-0.65)	-0.284 (-0.56)	-0.306 (-0.69)
North America			-0.142 (-0.29)	-0.143 (-0.29)	-0.159 (-0.35)	-0.0238 (-0.05)	-0.0378 (-0.08)	0.0113 (0.02)	-0.0495 (-0.10)	-0.0301 (-0.06)	-0.247 (-0.59)
China			-0.455 (-0.93)	-0.429 (-0.88)	-0.0202 (0.04)	-0.0238 (0.05)	-0.00794 (0.02)	0.0434 (0.09)	-0.0951 (-0.20)	-0.0588 (-0.12)	-0.0216 (-0.51)
India/Bangladesh/Pakistan			-0.729 (-1.48)	-0.634 (-1.28)	-0.0574 (-0.12)	-0.0533 (-0.11)	-0.0688 (-0.13)	-0.0256 (0.05)	-0.125 (-0.25)	-0.104 (-0.21)	-0.143 (-0.32)
Other Country			-0.660 (-1.37)	-0.616 (-1.28)	0.00182 (0.00)	0.00368 (0.01)	-0.0110 (-0.02)	0.103 (0.21)	-0.0131 (-0.03)	0.00518 (0.01)	-0.105 (-0.24)
Undergrad Uni World Rank				-0.298 (-1.32)	-0.245 (-1.16)	-0.250 (-1.18)	-0.245 (-1.13)	-0.319 (-1.54)	-0.295 (-1.42)	-0.337 (-1.66)	-0.338 (-1.66)
Canadian University					<b>0.693**</b> <b>(3.13)</b>	<b>0.694**</b> <b>(3.12)</b>	<b>0.689**</b> <b>(3.05)</b>	<b>0.661**</b> <b>(3.07)</b>	<b>0.602**</b> <b>(2.75)</b>	<b>0.596**</b> <b>(2.80)</b>	<b>0.610**</b> <b>(2.85)</b>
UofC Undergrad						-0.266 (-0.86)	-0.271 (-0.87)	-0.291 (-0.98)	-0.315 (-1.06)	-0.319 (-1.07)	-0.189 (-0.72)
Non-Econ Major							-0.0196 (-0.16)	0.0127 (0.11)	0.00307 (0.03)	0.0269 (0.22)	0.0412 (0.39)
Undergrad GPA								<b>0.319**</b> <b>(2.58)</b>	<b>0.323**</b> <b>(2.63)</b>	<b>0.278**</b> <b>(2.29)</b>	<b>0.276**</b> <b>(2.27)</b>
Fresh Grad									0.146 (1.26)	0.160 (1.35)	0.0690 (0.65)
Grad Uni World Rank										<b>-0.746**</b> <b>(-2.06)</b>	<b>-0.720**</b> <b>(-1.98)</b>
UofC Grad											.192 (0.85)
<b>Observations</b>	68	68	68	68	68	68	68	68	68	68	68
<b>Adjusted R-squared</b>	-0.014	-0.028	0.125	0.136	0.248	0.244	0.231	0.302	0.309	0.349	0.345

† statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

also produced a significant effect at the 5% level. It is important to remember that this variable

is recorded as a ratio from the total number of ranked universities worldwide. It takes values between 0 and 1. The closer the value is to 1, the lower ranked the university is. The negative sign on the coefficient therefore makes sense. If the rank ratio moves from 0.1 to 0.2, meaning that the graduate university is ranked 10 percentage points lower, the likelihood of acceptance falls by 7.2%.

The dummy variable "Canadian University" produced robust results throughout the different specifications. If the PHD applicant completed their undergraduate study at a Canadian University, they are 60% more likely to be accepted compared to a student who completed their undergraduate degree abroad.

The final specification which includes all the measured independent variables explains 35% of the variation in acceptance to the PHD program. This is a better result than that of the MA tests. The remaining explanation is again likely to be attributed to the essay and references presented by the applicant.

## 5.2 Enrollment

Upon acceptance, the applicant faces two decisions: to accept the offer, or to decline. The following tables show the results for the dependent variable "Enrolled", which takes value 1 if the applicant accepted the offer, and 0 if they declined. The sample used in this section is the sample of applicants who were accepted to their program of application.

### 5.2.1 MA Enrollment

Table 5.3 presents different specifications testing for the likelihood of the accepted MA applicant not declining UofC's offer. Age and gender did not appear to play any role in the decision of the student. All categories for the variable nationality seemed to produce significant results. However, the interpretation is somehow tricky since all of these coefficients are relative to the category "Missing". What the coefficients are saying is that compared to the category "Missing", all na-

Table 5.3: Likelihood of Enrollment for Accepted MA Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age at Application	0.0122 (1.07)	0.0120 (1.05)	0.00636 (0.52)	0.00612 (0.49)	0.00336 (0.28)	-0.000154 (-0.01)	-0.000263 (-0.02)	-0.00225 (-0.19)	-0.00303 (-0.25)	-0.00422 (-0.36)	-0.00493 (-0.42)
Female		0.0645 (0.77)	0.0656 (0.75)	0.0660 (0.76)	0.0628 (0.74)	-0.00147 (-0.02)	-0.00154 (-0.02)	-0.00175 (-0.02)	0.0157 (0.20)	0.00710 (0.09)	-0.0145 (-0.19)
Africa			0.384 (1.38)	0.379 (1.35)	<b>0.539*</b> (1.95)	<b>0.552**</b> (2.16)	<b>0.552**</b> (2.14)	<b>0.490*</b> (1.94)	<b>0.467*</b> (1.85)	<b>0.444*</b> (1.77)	<b>0.419*</b> (1.70)
North America			<b>0.424**</b> (1.98)	<b>0.422*</b> (1.95)	0.297 (1.39)	<b>0.328*</b> (1.66)	0.328 (1.65)	0.262 (1.34)	0.288 (1.47)	0.277 (1.42)	0.268 (1.40)
China			0.344 (1.57)	0.344 (1.56)	<b>0.394*</b> (1.84)	<b>0.377*</b> (1.90)	<b>0.377*</b> (1.89)	0.318 (1.62)	<b>0.355*</b> (1.80)	0.314 (1.59)	<b>0.341*</b> (1.75)
India/Bangladesh/Pakistan			<b>0.435*</b> (1.86)	<b>0.425*</b> (1.74)	<b>0.570**</b> (2.36)	<b>0.512**</b> (2.29)	<b>0.512**</b> (2.28)	<b>0.469**</b> (2.13)	<b>0.469**</b> (2.14)	<b>0.440**</b> (2.01)	<b>0.451**</b> (2.10)
Other Country			<b>0.536**</b> (2.28)	<b>0.534**</b> (2.26)	<b>0.577**</b> (2.50)	<b>0.557**</b> (2.62)	<b>0.557**</b> (2.60)	<b>0.517**</b> (2.48)	<b>0.525**</b> (2.52)	<b>0.496**</b> (2.38)	<b>0.532**</b> (2.60)
Undergrad World Rank				0.0372 (0.14)	0.202 (0.79)	<b>0.440*</b> (1.82)	<b>0.440*</b> (1.81)	<b>0.429*</b> (1.81)	0.365 (1.51)	0.355 (1.48)	0.252 (1.05)
Canadian University					<b>0.337**</b> (2.98)	0.0854 (0.73)	0.0859 (0.72)	0.0416 (0.35)	0.0594 (0.50)	0.0636 (0.54)	0.0718 (0.62)
UofC Undergrad						<b>0.488**</b> (4.83)	<b>0.487**</b> (4.80)	<b>0.492**</b> (4.97)	<b>0.463**</b> (4.57)	<b>0.482**</b> (4.75)	<b>0.478**</b> (4.80)
Non-Econ Major							0.00323 (0.02)	-0.0482 (-0.36)	-0.0708 (-0.52)	-0.0642 (-0.48)	-0.0286 (-0.21)
Undergrad GPA								<b>-0.339**</b> (-2.81)	<b>-0.323**</b> (-2.67)	<b>-0.287**</b> (-2.34)	<b>-0.266**</b> (-2.20)
Fresh Grad									-0.115 (-1.30)	-0.129 (-1.46)	-0.139 (-1.60)
Funding Offered										-0.00475 (-1.52)	<b>-0.00548*</b> (-1.78)
Thesis Based											<b>0.250**</b> (2.38)
Observations	141	141	141	141	141	141	141	141	141	141	141
Adjusted R-squared	0.001	-0.002	0.004	-0.003	0.053	0.191	0.185	0.226	0.230	0.238	0.266

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

nationalities have a positive likelihood of accepting the offer. However, some nationalities may have a higher probability than others. Chinese applicants for example are 34% more likely to accept while applicants from India, Bangladesh, or Pakistan are 45% more likely to accept the offer.

Undergraduate GPA produced a negative, statistically significant at the 5% level, coefficient. If the accepted applicant's GPA increases from 3.0 to 4.0, they become 27% less likely to accept UofC's offer. The negative sign on the coefficient makes sense since an applicant with a higher GPA is one that is more likely to have offers from other universities; therefore, they are in a position where they can decline UofC's offer for a better one from a different university.

The funding offered, as would be expected, plays a role in the accepted applicant's decision. It produced a result that is statistically significant at the 10% level. However, the sign of the coefficient can be counter-intuitive. What the result is saying is that if the accepted applicant's

funding increases by 1000 CAD, it decreases the likelihood of the applicant accepting the offer by a small 0.5%. One interpretation of this result can be that if the applicant has a high offer of funding from UofC, it is likely that they have an even higher one from a different university and are therefore more likely to decline UofC's offer.

The final variable that produced a significant result was "Thesis Based". If the accepted applicant applied to the thesis-based program, they are 25% more likely to accept the offer as compared to their course-based counterparts. This result is logical due to the idea that thesis-based applicants usually have a professor in mind that they would like to work with. If they do get an offer, their decision to accept will be easier.

The final specification which includes all of the measured independent variables explains 27% of the variation in enrollment. The remaining unexplained components are probably related to the offers the applicant has received from other universities. Other explanations may be related to location and/or personal circumstances.

### 5.2.2 PHD Enrollment

Table 5.4 presents the results for the same tests we ran for the accepted PHD sample. Only undergraduate GPA was found to have significant effect on PHD enrollment. Similar to the MA result, we found that if the PHD applicant's undergraduate GPA moves from 3.0 to 4.0, they become 37% less likely to accept UofC's offer.

Our final specification explains only 16% of the variation in PHD enrollment upon acceptance to the program. However, these results must be taken with caution as the sample size is very low with only 26 observations.

Table 5.4: Likelihood of Enrollment for Accepted PHD Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age at Application	<b>0.0276*</b> <b>(2.06)</b>	<b>0.0284*</b> <b>(1.92)</b>	0.0220 (1.26)	0.0228 (1.29)	0.0260 (1.47)	0.0264 (1.43)	0.0260 (1.40)	0.0247 (1.62)	0.0269 (1.61)	0.0400 (1.86)	0.0164 (1.28)	0.0166 (1.18)
Female		-0.0308 (-0.14)	-0.161 (-0.61)	-0.113 (-0.41)	-0.0430 (-0.15)	-0.0539 (-0.18)	0.0330 (0.11)	0.126 (0.49)	0.0932 (0.33)	-0.124 (-0.35)	0.376 (1.70)	0.374 (1.56)
Africa			1.051 (1.41)	0.813 (0.99)	1.050 (1.26)	1.058 (1.23)	1.235 (1.40)	0.983 (1.34)	0.980 (1.29)	1.443 (1.61)	1.174 (2.35)	1.181 (2.13)
North America			0.301 (0.56)	0.283 (0.52)	0.261 (0.49)	0.229 (0.39)	0.390 (0.63)	0.190 (0.37)	0.149 (0.27)	0.172 (0.32)	0.0625 (0.21)	0.0587 (0.18)
China			0.503 (0.92)	0.446 (0.80)	0.567 (1.01)	0.565 (0.98)	0.733 (1.20)	0.616 (1.22)	0.538 (0.97)	0.762 (1.27)	0.319 (0.92)	0.320 (0.87)
India/Bangladesh/Pakistan			0.625 (1.08)	0.540 (0.90)	0.735 (1.20)	0.736 (1.17)	0.914 (1.38)	0.793 (1.45)	0.709 (1.18)	0.715 (1.19)	0.777 (2.32)	0.779 (2.19)
Other Country			0.635 (1.16)	0.513 (0.89)	0.764 (1.26)	0.763 (1.22)	0.956 (1.44)	0.718 (1.30)	0.641 (1.07)	0.678 (1.12)	0.777 (2.31)	0.777 (2.19)
Undergrad Uni World Rank				0.591 (0.75)	0.760 (0.96)	0.758 (0.93)	1.066 (1.20)	1.186 (1.62)	1.091 (1.38)	0.272 (0.24)	0.455 (0.71)	0.444 (0.61)
Canadian University					0.376 (1.20)	0.375 (1.16)	0.483 (1.40)	0.434 (1.53)	0.391 (1.25)	0.226 (0.64)	0.614 (1.74)	0.613 (1.55)
UofC Undergrad						0.0669 (0.16)	0.126 (0.29)	0.286 (0.78)	0.263 (0.69)	0.245 (0.64)	0.134 (0.63)	0.141 (0.53)
Non-Econ Major							0.250 (0.93)	0.191 (0.86)	0.179 (0.77)	0.154 (0.66)	0.207 (1.59)	0.207 (1.51)
Undergrad GPA								<b>-0.648**</b> <b>(-2.77)</b>	<b>-0.643**</b> <b>(-2.65)</b>	<b>-0.581**</b> <b>(-2.31)</b>	<b>-0.373**</b> <b>(-2.56)</b>	<b>-0.377*</b> <b>(-2.12)</b>
Fresh Grad									0.0875 (0.41)	0.194 (0.81)	-0.0852 (-0.59)	-0.0875 (-0.54)
Grad Uni World Rank										-5.239 (-0.97)	2.156 (0.65)	2.081 (0.53)
UofC Grad											0.492 (1.43)	0.492 (1.36)
Funding Offered												-0.000112 (-0.04)
<b>Observations</b>	26	26	26	26	26	26	26	26	26	26	26	26
<b>Adjusted R-squared</b>	0.115	0.078	0.006	-0.019	0.008	-0.057	-0.067	0.277	0.228	0.169	0.241	0.157

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.

Coefficients for country are all relative to the category "Missing"

## 5.3 Program Completion

The focus now moves to those who were actually enrolled in the program. The following table shows the results for the regressions on the dummy variable "Graduated" which takes value 1 if the student did not drop out or was forced to withdraw and takes value 0 if they did. We performed the test for only the MA sample as the PHD sample size was too small to produce significant results.

### 5.3.1 MA Program Completion

For the first two specifications, age seemed to have a significant, negative effect on the likelihood of program completion. However, the significance of the result disappeared as more variables were

accounted for.

Table 5.5: Likelihood of Graduation for Enrolled MA Students

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age at Application	<b>-0.0152*</b> <b>(-1.76)</b>	<b>-0.0150*</b> <b>(-1.73)</b>	-0.0120 (-1.36)	-0.0110 (-1.23)	-0.0107 (-1.18)	-0.0117 (-1.31)	-0.00781 (-0.77)	-0.00858 (-0.84)	-0.00962 (-0.94)	-0.00880 (-0.86)	-0.00819 (-0.82)
Female		-0.0379 (-0.57)	-0.104 (-1.52)	-0.106 (-1.55)	-0.110 (-1.58)	<b>-0.132*</b> <b>(-1.88)</b>	<b>-0.134*</b> <b>(-1.91)</b>	<b>-0.136*</b> <b>(-1.94)</b>	<b>-0.143**</b> <b>(-2.03)</b>	<b>-0.127*</b> <b>(-1.78)</b>	<b>-0.117*</b> <b>(-1.68)</b>
Africa			-0.0731 (-0.23)	-0.0591 (-0.18)	-0.0312 (-0.09)	-0.123 (-0.37)	-0.105 (-0.32)	-0.0839 (-0.25)	-0.0407 (-0.12)	-0.0828 (-0.25)	-0.199 (-0.60)
North America			-0.332 (-1.14)	-0.323 (-1.10)	-0.326 (-1.10)	-0.444 (-1.49)	-0.426 (-1.42)	-0.408 (-1.35)	-0.385 (-1.28)	-0.409 (-1.36)	<b>-0.548*</b> <b>(-1.80)</b>
China			-0.0715 (-0.25)	-0.0688 (-0.23)	-0.0568 (-0.19)	-0.180 (-0.60)	-0.156 (-0.51)	-0.132 (-0.43)	-0.120 (-0.39)	-0.133 (-0.44)	-0.294 (-0.95)
India/Bangladesh/Pakistan			-0.0827 (-0.28)	-0.0607 (-0.20)	-0.0320 (-0.10)	-0.154 (-0.49)	-0.163 (-0.52)	-0.133 (-0.42)	-0.0793 (-0.25)	-0.101 (-0.32)	-0.240 (-0.75)
Other Country			-0.123 (-0.42)	-0.113 (-0.38)	-0.0955 (-0.32)	-0.214 (-0.70)	-0.206 (-0.67)	-0.174 (-0.56)	-0.137 (-0.44)	-0.166 (-0.54)	-0.345 (-1.09)
Undergrad Uni World Rank				-0.0988 (-0.61)	-0.0835 (-0.51)	0.00927 (0.05)	-0.00694 (-0.04)	0.00620 (0.04)	0.0676 (0.38)	0.0688 (0.38)	0.129 (0.72)
Canadian University					0.0414 (0.45)	-0.0473 (-0.45)	-0.0670 (-0.62)	-0.0650 (-0.60)	-0.0814 (-0.75)	-0.0912 (-0.84)	-0.117 (-1.09)
UofC Undergrad						<b>0.153*</b> <b>(1.72)</b>	<b>0.151*</b> <b>(1.70)</b>	<b>0.151*</b> <b>(1.70)</b>	<b>0.162*</b> <b>(1.83)</b>	<b>0.156*</b> <b>(1.75)</b>	<b>0.156*</b> <b>(1.79)</b>
Non-Econ Major							-0.0981 (-0.82)	-0.0988 (-0.82)	-0.0614 (-0.50)	-0.0650 (0.53)	-0.0827 (-0.68)
Undergrad GPA								-0.0875 (-0.84)	-0.111 (-1.06)	-0.141 (-1.31)	-0.144 (-1.36)
Fresh Grad									0.0955 (1.27)	0.0954 (1.28)	0.108 (1.47)
Funding Offered										0.00515 (1.24)	<b>0.00773*</b> <b>(1.80)</b>
Thesis Based											<b>-0.164*</b> <b>(-1.86)</b>
<b>Observations</b>	81	81	81	81	81	81	81	81	81	81	81
<b>Adjusted R-squared</b>	0.025	0.017	0.110	0.102	0.092	0.117	0.112	0.109	0.117	0.124	0.155

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

Gender had a robust effect that is significant at the 10% level throughout all specifications. We found that female students are 12% more likely to drop out of the program compared to their male counterparts. There can be several explanations to this result.

Studies like Shih et. al (1999), Steele et.al (1995), and Rydell et. al (2009) all emphasized the role of stereotypes (women are worse at math) and the existence of stereotype threat effects on performance. Rydell et. al showed that triggering different salient identities can improve performance. The Department of Economics should therefore put some focus on creating a salient Economist identity in its female students, overcoming the negative stigma arising from a specific stereotype.

Other studies such as Hoffman et. al (2009) discussed the role of instructor gender and the

existence of role models to female students. They found that female students perform better when they encounter more female professors. Out of the 35 professors and instructors at the Department of Economics, only 5 are women. This can also be a subtle reason for why women are dropping out. The Department should also put emphasis on providing successful women role models perhaps by hiring more female faculty and by assigning female instructors to the core Economics courses.

Moving on, we found that students who completed their undergraduate degree at UofC are 16% more likely to complete the program as compared to students who completed their undergraduate study at other universities. This result may be due to the fact that UofC undergraduates are more familiar with the UofC environment in general. However, the more reasonable explanation is that UofC's undergraduate program is one that properly prepares students for continuing in an MA as compared to other undergraduate programs. It is therefore important for the Department to put some emphasis on preparing non ex-UofC graduates for the MA program through preparatory courses if needed.

We also found that students who receive 1,000 CAD more in funding are 0.7% more likely to complete the program. The effect of funding on program completion is much smaller than expected. This is due to the measurement problem discussed earlier. The variable we use is only the initial amount of funding offered to the student; which in most cases is a lot less than what the students actually received. It is most probable that the additional funding received does largely contribute to a smoother graduate experience; however, that additional funding was not captured by our variable, thus the small coefficient.

Our final result is that thesis-based MA students are 16% less likely to graduate, or in other words, 16% more likely to drop out. This result makes sense since the thesis-based program is longer and involves a research project, which can be overwhelming to some students. It is therefore important for supervisors to continuously encourage and motivate their students.

## 5.4 Grades

In this section, we use the sample of MA students who completed the program. We collected data for grades in the form of A, A-, B+, B, B-, etc. We then converted these grades to a numerical scale, where A+ took the value 13, A took the value 12, A- took 11, and so on. Table 5.7 displays only the final specification which included all the independent variables for each of the three core ECON courses.

### 5.4.1 MA Grades in Core Econ Courses

The results for the regression on the ECON657 grade, which is the core Microeconomics course, produced statistically significant results for only one variable, the funding offered. It seems that students with higher funding do better in microeconomics. However, this result is probably not at all related to the actual funding received. It is very likely that a student who has higher funding is already a better student. It is not the funding that makes them a better student.

For ECON659, the core Macroeconomics course, we found a statistically significant negative coefficient on the dummy variable "Non-Econ Major". This result makes sense and would be expected since non-econ majors are understandably more likely to struggle in the course compared to Econ majors who would be more familiar with the material.

Finally, for the last core course, ECON 615, Econometrics, we found that the ranking of the university of undergraduate study seemed to play a significant role in the student's performance. We found that students who come from lower ranked universities tend to do worse. Note that the variables measured explain only less than 10% of the variation in grades.



Table 5.6: Grades for MA Enrolled Students

	Econ 657	Econ 659	Econ 615
Age at Application	-0.00607 (-0.08)	0.0523 (0.53)	0.0431 (0.29)
Female	-0.728 (-1.36)	-0.135 (-0.19)	0.983 (1.15)
Africa	1.275 (0.55)	2.274 (0.73)	1.044 (0.31)
Canada/U.SA/Mexico	0.178 (0.11)	3.221 (1.49)	1.537 (0.64)
China	0.730 (0.46)	2.895 (1.34)	0.150 (0.06)
India/Bangladesh/Pakistan	-0.455 (-0.27)	1.193 (0.52)	1.866 (0.74)
Other Country	0.617 (0.38)	2.034 (0.92)	0.743 (0.31)
Undergrad Uni World Rank	3.626 (1.69)	2.911 (1.01)	<b>-5.786**</b> <b>(-2.33)</b>
Canadian University	0.339 (0.47)	0.224 (0.23)	-0.574 (-0.53)
UofC Undergrad	0.715 (1.20)	-0.192 (-0.24)	0.173 (0.19)
Non-Econ Major	-1.653 (-1.53)	<b>-2.968*</b> <b>(-2.03)</b>	-1.425 (-0.40)
Undergrad GPA	-0.122 (-0.16)	0.509 (0.49)	0.835 (0.73)
Fresh Grad	-0.0573 (-0.11)	-0.296 (-0.40)	0.0982 (0.12)
Funding Offered	<b>0.0547*</b> <b>(1.86)</b>	-0.0110 (-0.28)	0.0217 (0.50)
Thesis Based	0.569 (0.98)	0.296 (0.38)	-0.761 (-0.86)
<b>Observations</b>	50	50	50
<b>Adjusted R-squared</b>	0.096	-0.058	-0.060

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

## 5.5 Employment After Graduation

The final outcome variable of interest is the job placement after graduation. This was recorded by looking at the job title and organization found on the student's LinkedIn account.

As we previously discussed in the data section, there are four different job outcomes for the student. The student either continued in academia and pursued a PHD degree, worked in the banking sector, worked with the government, or worked at a privately owned company.

For each of the non-continued-in-PHD outcomes, we also categorized the type of position into three categories: Analyst, Low Level, and Medium/High Level.

### 5.5.1 MA Employment After Graduation

Table 5.8 shows the specifications which include all of the measured independent variables for each of the outcomes discussed above.

We found that females are 15% less likely to continue in PHD after completing their MA degree as compared to their male counterparts. We also found that thesis-based students are 21% more likely to continue in PHD as compared to their course-based counterparts.

Table 5.7: After Graduation Employment Outcomes for MA Graduates

	Continued in PHD	Analyst	Low Level	Medium/High Level	Banking	Government	Private
Age at Application	0.0141 (1.13)	-0.0154 (-0.83)	-0.0105 (-0.58)	0.0140 (0.56)	0.00862 (0.52)	<b>-0.0424**</b> <b>(-2.33)</b>	0.0161 (0.64)
Female	<b>-0.152*</b> <b>(-1.72)</b>	-0.238 (-1.62)	0.178 (1.25)	0.249 (1.27)	0.148 (1.13)	0.0610 (0.43)	-0.0122 (-0.06)
Africa	0.0563 (0.17)	-0.320 (-0.59)	0.344 (0.66)	0.225 (0.31)	<b>1.123**</b> <b>(2.33)</b>	-0.505 (-0.95)	0.526 (0.72)
North America	0.208 (0.66)	-0.289 (-0.59)	0.149 (0.31)	-0.270 (-0.41)	0.257 (0.59)	-0.0706 (-0.15)	0.177 (0.27)
China	0.224 (0.69)	-0.372 (-0.75)	0.404 (0.85)	-0.345 (-0.52)	0.698 (1.58)	-0.511 (-1.06)	0.246 (0.37)
India/Bangladesh/Pakistan	0.171 (0.53)	-0.336 (-0.70)	0.415 (0.89)	-0.396 (-0.61)	0.454 (1.06)	-0.169 (-0.36)	0.189 (0.29)
Other Country	0.126 (0.39)	0.0899 (0.18)	0.320 (0.68)	-0.682 (-1.04)	0.133 (0.31)	-0.193 (-0.40)	0.435 (0.66)
Undergrad Uni World Rank	0.611 (1.36)	-0.234 (-0.33)	-0.224 (-0.32)	-0.0670 (-0.07)	-0.789 (-1.23)	-0.120 (-0.17)	0.353 (0.36)
Canadian University	0.108 (0.81)	-0.0576 (-0.27)	-0.0281 (-0.14)	0.170 (0.59)	<b>0.411**</b> <b>(2.15)</b>	-0.237 (-1.13)	-0.0914 (-0.31)
UofC Undergrad	-0.0557 (-0.49)	0.0176 (0.10)	-0.0177 (-0.10)	-0.0645 (-0.26)	<b>-0.358**</b> <b>(-2.19)</b>	0.258 (1.44)	-0.0266 (-0.11)
Non-Econ Major	-0.121 (-0.81)	<b>0.450*</b> <b>(2.00)</b>	-0.103 (-0.48)	-0.104 (-0.35)	-0.0211 (-0.11)	<b>0.374*</b> <b>(1.70)</b>	-0.0678 (-0.22)
Undergrad GPA	-0.0478 (-0.35)	0.110 (0.46)	0.262 (1.14)	0.119 (0.38)	<b>0.411*</b> <b>(1.95)</b>	0.333 (1.44)	-0.143 (-0.45)
Fresh Grad	-0.0756 (-0.87)	-0.0907 (-0.68)	<b>0.254*</b> <b>(1.97)</b>	-0.120 (-0.67)	-0.0521 (-0.44)	-0.205 (-1.57)	0.280 (1.56)
Funding Offered	0.00458 (0.84)	0.00160 (0.17)	-0.00491 (-0.55)	-0.00112 (-0.09)	0.00452 (0.55)	<b>-0.0248**</b> <b>(-2.73)</b>	0.0178 (1.42)
Thesis Based	<b>0.212*</b> <b>(1.93)</b>	-0.164 (-0.82)	-0.0800 (-0.41)	-0.0251 (-0.09)	-0.0752 (-0.42)	-0.196 (-1.00)	-0.208 (-0.77)
<b>Observations</b>	47	47	47	47	47	47	47
<b>Adjusted R-squared</b>	-0.004	0.152	-0.008	-0.096	0.219	0.187	-0.156

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

Our results also show that Non-Econ Majors are 45% more likely to have the title "Analyst" compared to Econ Majors. Fresh graduates are 25% more likely to have a low level job compared to

those who took time between their undergraduate degree and their enrollment in the MA program.

We found that African MA graduates, graduates of Canadian universities, and those with higher undergraduate GPAs are all more likely to work in the Banking sector. Students who completed their undergraduate study at UofC are 35% less likely to work in the banking sector.

In the specification for government job, age appeared to have a statistically significant negative effect. We found that a student whose age is older than the mean age by 1 year is 4% less likely to work with the government. This might indicate the government agencies tend to hire younger people. It also appears that students who receive higher funding are less likely to work with the government.

## 6. Conclusion

The aim of this thesis was to provide both the student and the admissions committee with information that can improve their decision-making process.

The fact that a high GPA, a quality undergraduate education, and not waiting for too long to apply can all increase the probability of acceptance to graduate school should be of value to the potential applicant. Knowing that these variables combined explain only 20% of the acceptance process should be of even higher value to the potential applicant as it can serve as motivation to exert more effort in their application essay and/or interview.

When structuring their offers, the admissions committee should keep in mind that ex-UofC undergrads and those who attended a Canadian university are more likely to accept the offer and that fresh graduates, those with higher GPAs, and those who attended a Canadian university are more likely to reject.

The knowledge that those who previously attended UofC, those who received higher funding, and thesis-based students are less likely to drop out can also help the admissions committee with their selection criteria as well as motivate current and potential students to perform better and challenge these results. It can also motivate the introduction of prep courses for non-UofC undergrads in order to help them integrate into UofC's graduate program. The Department should also put emphasis on providing female role models to students as well as creating an atmosphere that makes the Economist identity salient in both female and male students.

Variables such as gender, nationality, GPA, undergraduate university quality, freshness of mind are in fact correlated with acceptance and performance in the MA or PHD programs. However,

the fact that together they explain so little of the variation in these dependent variables sends a message to both the potential student and the admissions committee that the true value of student is not simply captured by the variables we have on paper. This is why introducing interviews to the admissions process can greatly improve efficiency since it is likely to reveal the real potential of the student as well as assess their potential to be a good teacher. It would be interesting to see future studies which include the quality of the applicant's essay as well as their answers and attitude in an interview as an independent variable.

## 7. References

- [1] Herman Aguinis et al. “Power bases of faculty supervisors and educational outcomes for graduate students”. In: *The Journal of Higher Education* 67.3 (1996), pp. 267–297.
- [2] Susan Athey et al. “What Does Performance in Graduate School Predict? Graduate Economics Education and Student Outcomes”. In: *The American Economic Review* 97.2 (2007), pp. 512–518. ISSN: 00028282. URL: <http://www.jstor.org/stable/30034505>.
- [3] Leah Boustan and Andrew Langan. “Variation in Women’s Success across PhD Programs in Economics”. In: *Journal of Economic Perspectives* 33.1 (Feb. 2019), pp. 23–42. DOI: 10.1257/jep.33.1.23.
- [4] Howard R Bowen. “Graduate education in economics”. In: *The American Economic Review* (1953), pp. iv–223.
- [5] Donald O. Case and John V. Richardson. “Predictors of Student Performance with Emphasis on Gender and Ethnic Determinants”. In: *Journal of Education for Library and Information Science* 30.3 (1990), pp. 163–182. ISSN: 07485786. URL: <http://www.jstor.org/stable/40323444>.
- [6] Robert L Decker. “Success and attrition characteristics in graduate studies”. In: *The Journal of Economic Education* 4.2 (1973), pp. 130–137.
- [7] Judith M. Gertler and Allan H. Meltzer. “Selecting Creative Ph.D. Candidates for Admission”. In: *The Journal of Experimental Education* 38.3 (1970), pp. 15–18. DOI: 10.1080/00220973.1970.11011189.

- [8] Jean E Girves and Virginia Wemmerus. “Developing models of graduate student degree progress”. In: *The Journal of Higher Education* 59.2 (1988), pp. 163–189.
- [9] W Lee Hansen. “Prediction of graduate performance in economics”. In: *The Journal of Economic Education* 3.1 (1971), pp. 49–53.
- [10] Vicki L. Hesli et al. “Success in Graduate School and After: Survey Results from the Midwest Region, Part III”. In: *PS: Political Science & Politics* 39.2 (2006), 317fffdfffdfffd325. DOI: 10.1017/S1049096506060513.
- [11] Florian Hoffmann and Philip Oreopoulos. “A Professor like Me: The Influence of Instructor Gender on College Achievement”. In: *The Journal of Human Resources* 44.2 (2009), pp. 479–494. ISSN: 0022166X. URL: <http://www.jstor.org/stable/20648905>.
- [12] Samer Kherfi. “Economic Education in the Middle East: Are the Determinants of Success in Introductory Economics Any Different?” In: *The Journal of Economic Education* 39.1 (2008), pp. 22–40. ISSN: 00220485, 21524068. URL: <http://www.jstor.org/stable/41426800>.
- [13] Alan B Krueger and Stephen Wu. “Forecasting job placements of economics graduate students”. In: *The Journal of Economic Education* 31.1 (2000), pp. 81–94.
- [14] Nathan R. Kuncel, Marcus Credfffdfffd, and Lisa L. Thomas. “A Meta-Analysis of the Predictive Validity of the Graduate Management Admission Test (GMAT) and Undergraduate Grade Point Average (UGPA) for Graduate Student Academic Performance”. In: *Academy of Management Learning Education* 6.1 (2007), pp. 51–68. ISSN: 1537260X. URL: <http://www.jstor.org/stable/40214516>.
- [15] Nathan R Kuncel and Sarah A Hezlett. “Standardized tests predict graduate students’ success”. In: *Science* 315.5815 (2007), pp. 1080–1081.

- [16] Jason M. Lindo, Nicholas J. Sanders, and Philip Oreopoulos. “Ability, Gender, and Performance Standards: Evidence from Academic Probation”. In: *American Economic Journal: Applied Economics* 2.2 (2010), pp. 95–117. ISSN: 19457782, 19457790. URL: <http://www.jstor.org/stable/25760207>.
- [17] Charles R Link. “Graduate education, school quality, experience, student ability, and earnings”. In: *The Journal of Business* 48.4 (1975), pp. 477–491.
- [18] Helen A. Moore and Bruce Keith. “Human capital, social integration, and tournaments: A test of graduate student success models”. In: *The American Sociologist* 23.2 (June 1992), pp. 52–71. DOI: 10.1007/BF02691908.
- [19] Robert J Rydell, Allen R McConnell, and Sian L Beilock. “Multiple social identities and stereotype threat: imbalance, accessibility, and working memory.” In: *Journal of personality and social psychology* 96.5 (2009), p. 949.
- [20] Margaret Shih, Todd L. Pittinsky, and Nalini Ambady. “Stereotype Susceptibility: Identity Salience and Shifts in Quantitative Performance”. In: *Psychological Science* 10.1 (1999), pp. 80–83. ISSN: 09567976, 14679280. URL: <http://www.jstor.org/stable/40063382>.
- [21] Claude M Steele and Joshua Aronson. “Stereotype threat and the intellectual test performance of African Americans.” In: *Journal of personality and social psychology* 69.5 (1995), p. 797.
- [22] Warren W Willingham. “Predicting success in graduate education”. In: *Science* 183.4122 (1974), pp. 273–278.
- [23] Charles R Wright. “Success or failure in earning graduate degrees”. In: *Sociology of Education* (1964), pp. 73–97.



## 8. Appendix

Table 8.1: Funding Offered to Accepted MA Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age at Application	-112.3 (-0.39)	-100.4 (-0.35)	-213.1 (-0.68)	-187.9 (-0.60)	-203.5 (-0.64)	-239.5 (-0.76)	-270.1 (-0.79)	-228.2 (-0.68)	-248.9 (-0.74)	-256.1 (-0.76)
Female		-3058.5 (-1.44)	-1542.5 (-0.70)	-1584.5 (-0.72)	-1602.9 (-0.73)	-2259.7 (-1.02)	-2277.5 (-1.02)	-2273.0 (-1.03)	-1812.6 (-0.81)	-2087.7 (-0.93)
Africa			-6910.2 (-0.99)	-6430.5 (-0.91)	-5522.9 (-0.77)	-5393.0 (-0.75)	-5507.6 (-0.77)	-4196.4 (-0.59)	-4800.9 (-0.67)	-5084.9 (-0.71)
North America			-4362.8 (-0.81)	-4079.1 (-0.75)	-4781.3 (-0.86)	-4465.4 (-0.81)	-4582.8 (-0.83)	-3193.1 (-0.58)	-2496.3 (-0.45)	-2581.8 (-0.47)
China			-10769.5* (-1.95)	-10665.2 (-1.93)	-10377.2 (-1.86)	-10553.4 (-1.91)	-10675.7 (-1.92)	-9429.8 (-1.71)	-8454.4 (-1.52)	-8003.3 (-1.43)
India/Bangladesh/Pakistan			-8434.6 (-1.43)	-7415.8 (-1.21)	-6595.8 (-1.05)	-7189.8 (-1.15)	-7141.9 (-1.14)	-6224.2 (-1.00)	-6212.6 (-1.00)	-6003.1 (-0.97)
Other Country			-7395.7 (-1.25)	-7149.5 (-1.20)	-6907.4 (-1.15)	-7108.9 (-1.20)	-7137.7 (-1.20)	-6308.2 (-1.07)	-6102.4 (-1.04)	-5552.7 (-0.94)
Undergrad Uni World Rank				-3900.1 (-0.60)	-2965.9 (-0.44)	-539.4 (-0.08)	-595.7 (-0.09)	-373.3 (-0.06)	-2074.4 (-0.30)	-3455.7 (-0.50)
Canadian University					1903.8 (0.65)	-665.0 (-0.20)	-515.0 (-0.15)	419.6 (0.13)	890.5 (0.27)	991.8 (0.30)
UofC Undergrad						<b>4983.4*</b> <b>(1.77)</b>	<b>4941.4*</b> <b>(1.75)</b>	<b>4845.8*</b> <b>(1.73)</b>	4075.2 (1.42)	3983.5 (1.39)
Non-Econ Major							912.5 (0.24)	1995.7 (0.52)	1398.0 (0.36)	1868.5 (0.49)
Undergrad GPA								<b>7136.4**</b> <b>(2.09)</b>	<b>7557.1**</b> <b>(2.21)</b>	<b>7770.2**</b> <b>(2.27)</b>
Fresh Grad									-3022.7 (-1.21)	-3131.3 (-1.26)
Thesis Based										3399.5 (1.13)
<b>Observations</b>	141	141	141	141	141	141	141	141	141	141
<b>Adjusted R-squared</b>	-0.006	0.002	0.019	0.015	0.010	0.026	0.019	0.044	0.047	0.050

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

Table 8.2: Funding Offered to Accepted PHD Applicants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age at Application	-191.6 (-0.19)	-295.6 (-0.26)	559.3 (0.41)	470.4 (0.35)	659.2 (0.48)	858.6 (0.62)	855.5 (0.60)	780.8 (0.59)	-125.6 (-0.10)	1300.1 (0.87)	1632.5 (0.99)
Female		4217.2 (0.24)	-984.6 (-0.05)	-6198.0 (-0.29)	-2075.9 (-0.10)	-8138.3 (-0.37)	-7494.8 (-0.31)	-2205.4 (-0.10)	11317.4 (0.55)	-12291.6 (-0.50)	-19356.4 (-0.68)
Africa			-20612.1 (-0.36)	5246.4 (0.08)	19278.3 (0.30)	23845.2 (0.37)	25155.9 (0.37)	10874.7 (0.17)	12462.7 (0.23)	62815.1 (1.01)	66609.5 (1.03)
North America			-28046.8 (-0.67)	-26093.3 (-0.62)	-27415.5 (-0.65)	-45510.9 (-1.02)	-44317.1 (-0.93)	-55634.9 (-1.24)	-38690.1 (-0.98)	-36173.7 (-0.96)	-34629.1 (-0.89)
China			-52777.1 (-1.24)	-46587.0 (-1.09)	-39423.7 (-0.90)	-40550.9 (-0.93)	-39310.5 (-0.84)	-45942.4 (-1.05)	-13995.1 (-0.35)	10402.7 (0.25)	16666.5 (0.37)
India/Bangladesh/Pakistan			-33295.6 (-0.74)	-24067.9 (-0.53)	-12538.8 (-0.26)	-11855.2 (-0.25)	-10537.8 (-0.21)	-17425.8 (-0.37)	16791.0 (0.38)	17478.3 (0.42)	16606.1 (0.39)
Other Country			-50328.3 (-1.18)	-37055.9 (-0.83)	-22248.6 (-0.47)	-22521.3 (-0.48)	-21090.9 (-0.41)	-34604.5 (-0.72)	-3241.3 (-0.07)	707.2 (0.02)	-693.7 (-0.02)
Undergrad Uni World Rank				-64225.3 (-1.06)	-54239.1 (-0.87)	-55661.1 (-0.91)	-53379.4 (-0.78)	-46591.6 (-0.73)	-7647.2 (-0.13)	-96640.5 (-1.21)	-99218.6 (-1.20)
Canadian University					22238.6 (0.91)	21293.0 (0.88)	22098.0 (0.83)	19309.0 (0.78)	37152.0 (1.62)	19291.1 (0.78)	12900.1 (0.46)
UofC Undergrad						37185.8 (1.15)	37625.6 (1.12)	46658.5 (1.47)	<b>55933.7*</b> (2.01)	<b>54036.7*</b> (2.05)	55605.4 (2.03)
Non-Econ Major							1851.5 (0.09)	-1487.3 (-0.08)	3559.5 (0.21)	846.4 (0.05)	95.44 (0.01)
Undergrad GPA								<b>-36761.2*</b> (-1.80)	<b>-38821.3**</b> (-2.19)	<b>-32014.5*</b> (-1.84)	<b>-34947.3*</b> (-1.87)
Fresh Grad									<b>-35818.9**</b> (-2.29)	24217.8 (-1.45)	-20273.3 (-1.09)
Grad Uni World Rank										-569800.1 (-1.53)	-674226.7 (-1.57)
UofC Grad											-10338.2 (-0.56)
<b>Observations</b>	26	26	26	26	26	26	26	26	26	26	26
<b>Adjusted R-squared</b>	-0.040	-0.083	-0.200	-0.193	-0.205	-0.180	-0.264	-0.089	0.179	0.261	0.212

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.

Coefficients for country are all relative to the category "Missing"

Table 8.3: Time Taken to Finish Program for Enrolled MA Students

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age at Application	0.174 (0.50)	0.174 (0.50)	0.223 (0.60)	0.223 (0.60)	0.224 (0.60)	0.218 (0.58)	0.374 (0.89)	0.378 (0.88)	0.221 (0.54)	0.141 (0.34)
Female		-1.857 (-0.76)	-2.140 (-0.76)	-2.128 (-0.74)	-1.799 (-0.62)	-2.002 (-0.67)	-2.302 (-0.76)	-2.279 (-0.74)	-1.416 (-0.48)	-2.504 (-0.82)
Africa			3.316 (0.35)	3.276 (0.34)	4.621 (0.48)	5.551 (0.54)	5.952 (0.58)	5.489 (0.50)	0.852 (0.08)	6.202 (0.55)
North America			<b>6.057*</b> <b>(1.79)</b>	<b>6.034*</b> <b>(1.72)</b>	<b>7.744*</b> <b>(2.01)</b>	<b>7.730*</b> <b>(1.98)</b>	<b>8.435**</b> <b>(2.11)</b>	<b>8.530**</b> <b>(2.07)</b>	5.913 (1.45)	5.726 (1.42)
China			3.933 (1.12)	3.892 (1.02)	4.589 (1.19)	4.644 (1.19)	5.670 (1.38)	5.714 (1.37)	2.653 (0.64)	2.512 (0.61)
India/Bangladesh/Pakistan			-0.981 (-0.20)	-0.934 (-0.18)	-1.385 (-0.27)	-1.677 (-0.32)	-2.366 (-0.44)	-2.257 (-0.41)	1.212 (0.22)	-0.680 (-0.12)
Other Country			0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Undergrad Uni World Rank				-0.402 (-0.03)	-6.756 (-0.47)	-4.978 (-0.32)	-7.688 (-0.48)	-8.116 (-0.49)	-3.173 (-0.20)	-3.420 (-0.22)
Canadian University					-4.123 (-1.04)	-4.755 (-1.06)	-6.070 (-1.27)	-5.978 (-1.22)	-5.169 (-1.11)	-5.875 (-1.26)
UofC Undergrad						1.108 (0.30)	0.722 (0.20)	0.640 (0.17)	1.039 (0.29)	1.902 (0.52)
Non-Econ Major							-4.087 (-0.85)	-4.058 (-0.83)	0.0958 (0.02)	0.0440 (0.01)
Undergrad GPA								0.637 (0.13)	1.100 (0.24)	1.735 (0.38)
Fresh Grad									<b>7.124**</b> <b>(2.34)</b>	<b>5.989*</b> <b>(1.90)</b>
Funding Offered										-0.255 (-1.28)
<b>Observations</b>	54	54	54	54	54	54	54	54	54	54
<b>Adjusted R-squared</b>	-0.014	-0.023	-0.013	-0.035	-0.033	-0.054	-0.061	-0.086	0.018	0.033

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

Table 8.4: Time Taken to Finish Program for Enrolled PHD Students

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Age at Application	0.104 (0.07)	0.104 (0.07)	-3.590 (-0.62)	-3.930 (-0.60)	-3.930 (-0.60)	-1.464 (-0.73)	-2.767 (.)	-2.767 (.)	-2.767 (.)	-2.767 (.)	-2.767 (.)	-2.767 (.)	-2.767 (.)
Female		1.971 (0.15)	-3.764 (-0.19)	-9.305 (-0.39)	-9.305 (-0.39)	-14.03 (-1.99)	-15.73 (.)	-15.73 (.)	-15.73 (.)	-15.73 (.)	-15.73 (.)	-15.73 (.)	-15.73 (.)
North America			-22.37 (-0.78)	-30.97 (-0.88)	-30.97 (-0.88)	-74.55 (-5.35)	-74.44 (.)	-74.44 (.)	-74.44 (.)	-74.44 (.)	-74.44 (.)	-74.44 (.)	-74.44 (.)
China			-7.166 (-0.33)	-11.14 (-0.44)	-11.14 (-0.44)	-30.42 (-3.58)	-33.40 (.)	-33.40 (.)	-33.40 (.)	-33.40 (.)	-33.40 (.)	-33.40 (.)	-33.40 (.)
India/Bangladesh/Pakistan			13.19 (0.48)	13.99 (0.45)	13.99 (0.45)	4.255 (0.45)	9.036 (.)	9.036 (.)	9.036 (.)	9.036 (.)	9.036 (.)	9.036 (.)	9.036 (.)
Other Country			0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Undergrad Uni World Rank				-23.86 (-0.61)	-23.86 (-0.61)	-61.47 (-4.39)	-61.30 (.)	-61.30 (.)	-61.30 (.)	-61.30 (.)	-61.30 (.)	-61.30 (.)	-61.30 (.)
Canadian University						43.02 (4.69)	41.66 (.)	41.66 (.)	41.66 (.)	41.66 (.)	41.66 (.)	41.66 (.)	41.66 (.)
UofC Undergrad							-8.674 (.)	-8.674 (.)	-8.674 (.)	-8.674 (.)	-8.674 (.)	-8.674 (.)	-8.674 (.)
Non-Econ Major								0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Undergrad GPA									0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Fresh Grad										0 (.)	0 (.)	0 (.)	0 (.)
Grad Uni World Rank											0 (.)	0 (.)	0 (.)
UofC Grad												0 (.)	0 (.)
Funding Offered													0 (.)
<b>Observations</b>	9	9	9	9	9	9	9	9	9	9	9	9	9
<b>Adjusted R-squared</b>	-0.142	-0.327	-1.087	-1.636	-1.636	0.771	.	.	.	.	.	.	.

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"

Table 8.5: Time Taken to Find First Job After Graduating for MA Graduates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age at Application	-0.0332 (-0.22)	-0.0321 (-0.21)	-0.00511 (-0.03)	-0.00615 (-0.04)	-0.00313 (-0.02)	-0.00627 (-0.04)	-0.0141 (-0.07)	-0.0137 (-0.07)	-0.0433 (-0.21)	-0.0469 (-0.22)	-0.0476 (-0.22)
Female		-0.160 (-0.14)	-0.369 (-0.26)	-0.397 (-0.27)	-0.947 (-0.65)	-0.999 (-0.66)	-0.976 (-0.62)	-0.736 (-0.43)	-0.729 (-0.42)	-0.743 (-0.42)	-0.751 (-0.42)
Africa			1.974 (0.35)	1.530 (0.26)	3.784 (0.64)	3.570 (0.58)	3.560 (0.57)	4.152 (0.63)	4.898 (0.74)	4.814 (0.71)	4.610 (0.66)
North America			1.122 (0.26)	1.044 (0.24)	0.543 (0.13)	0.269 (0.06)	0.227 (0.05)	0.248 (0.05)	0.540 (0.11)	0.650 (0.13)	1.257 (0.23)
China			2.309 (0.54)	2.299 (0.53)	2.637 (0.62)	2.403 (0.53)	2.320 (0.49)	2.244 (0.47)	2.490 (0.52)	2.563 (0.52)	3.175 (0.57)
India/Bangladesh/Pakistan			2.635 (0.61)	2.241 (0.50)	3.549 (0.79)	3.314 (0.70)	3.334 (0.69)	3.260 (0.67)	3.908 (0.79)	3.946 (0.78)	4.282 (0.81)
Other Country			3.041 (0.72)	2.841 (0.66)	3.819 (0.89)	3.602 (0.80)	3.583 (0.78)	3.286 (0.69)	3.448 (0.73)	3.522 (0.73)	4.071 (0.75)
Undergrad Uni World Rank				2.076 (0.38)	6.619 (1.08)	7.012 (1.07)	7.115 (1.05)	5.723 (0.72)	6.843 (0.85)	6.708 (0.81)	6.548 (0.78)
Canadian University					3.199 (1.54)	3.084 (1.40)	3.134 (1.35)	2.966 (1.23)	2.717 (1.12)	2.616 (1.02)	2.489 (0.94)
UofC Undergrad						0.321 (0.18)	0.341 (0.19)	0.142 (0.07)	0.517 (0.26)	0.568 (0.28)	0.556 (0.27)
Non-Econ Major							0.198 (0.08)	0.290 (0.12)	0.667 (0.26)	0.629 (0.24)	0.586 (0.22)
Undergrad GPA								0.959 (0.35)	0.887 (0.32)	0.896 (0.32)	0.822 (0.29)
Fresh Grad									1.415 (0.99)	1.418 (0.97)	1.345 (0.89)
Funding Offered										-0.0147 (-0.14)	-0.0217 (-0.20)
Thesis Based											0.576 (0.24)
<b>Observations</b>	42	42	42	42	42	42	42	42	42	42	42
<b>Adjusted R-squared</b>	-0.024	-0.050	-0.145	-0.175	-0.127	-0.162	-0.201	-0.237	-0.238	-0.283	-0.329

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.

Coefficients for country are all relative to the category "Missing"

Table 8.6: Current (2019) Employment for Entire Sample

	Analyst	Low Level	Medium/High Level	Academic	Banking	Government	Private
Age at Application	-0.0116 (-1.23)	0.00323 (0.64)	-0.0148 (-1.31)	<b>0.0256**</b> <b>(2.50)</b>	-0.00856 (-1.00)	<b>-0.0182**</b> <b>(-2.08)</b>	0.00117 (0.11)
Female	0.0954 (1.28)	<b>0.0955**</b> <b>(2.37)</b>	-0.146 (-1.63)	-0.0407 (-0.50)	0.0466 (0.69)	0.0390 (0.56)	-0.0448 (-0.53)
Africa	0.326 (1.38)	0.0174 (0.14)	0.279 (0.99)	<b>-0.441*</b> <b>(-1.71)</b>	<b>0.359*</b> <b>(1.67)</b>	0.0364 (0.17)	0.0448 (0.17)
North America	0.315 (1.62)	0.00692 (0.07)	0.0932 (0.40)	<b>-0.422**</b> <b>(-1.98)</b>	0.145 (0.82)	0.164 (0.90)	0.113 (0.51)
China	0.114 (0.55)	0.0716 (0.64)	0.115 (0.46)	-0.254 (-1.12)	0.263 (1.39)	-0.112 (-0.58)	0.102 (0.43)
India/Bangladesh/Pakistan	0.157 (0.73)	-0.0534 (-0.46)	0.163 (0.64)	-0.178 (-0.76)	0.00669 (0.03)	0.0166 (0.08)	0.155 (0.63)
Other Country	0.0831 (0.40)	-0.0327 (-0.29)	0.313 (1.25)	-0.260 (-1.14)	0.166 (0.87)	0.0410 (0.21)	0.0533 (0.22)
Undergrad Uni World Rank	0.0485 (0.26)	-0.0124 (-0.12)	0.0226 (0.10)	-0.0983 (-0.48)	-0.0756 (-0.44)	0.110 (0.63)	0.0642 (0.30)
Canadian University	0.0218 (0.18)	-0.0912 (-1.43)	<b>0.244*</b> <b>(1.72)</b>	-0.0922 (-0.72)	-0.0714 (-0.66)	0.0757 (0.69)	0.0880 (0.65)
UofC Undergrad	-0.0201 (-0.18)	-0.0113 (-0.19)	0.126 (0.94)	-0.0215 (-0.18)	-0.0197 (-0.19)	0.00449 (0.04)	0.0368 (0.29)
Non-Econ Major	0.0407 (0.40)	0.0297 (0.53)	-0.0433 (-0.35)	0.00442 (0.04)	0.108 (1.16)	-0.0637 (-0.67)	-0.0486 (-0.41)
Undergrad GPA	0.00263 (0.03)	0.0338 (0.60)	0.0868 (0.70)	-0.103 (-0.91)	0.124 (1.32)	0.0929 (0.96)	-0.114 (-0.96)
Attended Grad School	0.122 (1.63)	0.0475 (1.17)	0.0602 (0.67)	<b>-0.257**</b> <b>(-3.15)</b>	0.0525 (0.77)	<b>0.120*</b> <b>(1.72)</b>	0.0848 (0.99)
<b>Observations</b>	140	140	140	140	140	140	140
<b>Adjusted R-squared</b>	0.021	0.018	0.033	0.171	0.026	0.100	-0.054

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.

Coefficients for country are all relative to the category "Missing"

Table 8.7: Probit Regression Results

	MA Acceptance	PHD Acceptance	MA Enrollment	MA Graduation
Age at Application	-0.0467 (-0.75)	0.0288 (0.74)	-0.332 (-0.87)	0.00623 (0.06)
Female	-0.429 (-0.69)	0.711 (1.40)	-0.0398 (-0.15)	-0.507 (-0.54)
Africa	-1.053 (-1.25)	<b>-1.433*</b> <b>(-1.96)</b>	<b>1.991**</b> <b>(2.07)</b>	0 (.)
North America	0 (.)	-0.832 (0.00)	1.238 (1.60)	-6.997 (-0.01)
China	4.240 (0.01)	-0.264 (-0.39)	<b>1.532*</b> <b>(1.87)</b>	0 (.)
India/Bangladesh/Pakistan	-0.504 (-0.61)	-1.221 (-1.46)	<b>1.939**</b> <b>(2.16)</b>	0 (.)
Other Country	0 (.)	0 (.)	<b>2.287**</b> <b>(2.64)</b>	0 (.)
Undergrad Uni World Rank	-0.310 (-0.15)	-1.602 (-1.39)	0.830 (0.87)	2.453 (1.44)
Canadian University	-5.005 (-0.01)	6.378 (0.01)	0.329 (0.82)	3.993 (0.01)
UofC Undergrad	0 (.)	-6.058 (-0.01)	<b>1.762**</b> <b>(4.44)</b>	<b>3.655*</b> <b>(1.74)</b>
Non-Econ Major	0.181 (0.27)	0.305 (0.60)	-0.223 (-0.51)	-2.437 (-1.22)
Undergrad GPA	0.797 (1.03)	<b>1.438**</b> <b>(2.20)</b>	<b>-1.003*</b> <b>(-2.31)</b>	-1.874 (-0.98)
Fresh Grad	0 (.)	0.457 (0.95)	<b>-0.504*</b> <b>(-1.66)</b>	0.282 (0.24)
Grad Uni World Rank	N/A	-8.426 (-1.41)	N/A	N/A
UofC Grad	N/A	0.843 (0.87)	N/A	N/A
Funding Offered	N/A	N/A	<b>-0.0189*</b> <b>(-1.65)</b>	0.331 (1.53)
Thesis-Based	-0.306 (-0.50)	N/A	<b>0.937*</b> <b>(2.51)</b>	<b>-6.910*</b> <b>(-1.74)</b>
<b>Observations</b>	39	67	139	43
<b>Pseudo R-Squared</b>	0.17	0.48	0.30	0.58

t statistics in parentheses, \* p < 0.10, \*\* p < 0.05.  
Coefficients for country are all relative to the category "Missing"