

ENROLLMENT FUNNEL ANALYSIS

Prepared for Western Oregon University

June 2018



In the following report, Hanover Research examines the predictors of enrollment among students who were admitted to Western Oregon University between the 2012 and 2017 enrollment cycles.

TABLE OF CONTENTS

Executive Summary and Key Findings	3
INTRODUCTION	3
KEY FINDINGS	3
RECOMMENDATIONS	4
Section I: Data and Methodology	5
DATA OVERVIEW	5
Dependent Variable (Outcome)	5
Independent Variable (Predictors)	6
METHODOLOGY	7
Section II: Logistic Regression Results	8

EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

In this report, Hanover Research examines admissions, academic, and demographic data from Western Oregon University's (WOU) admitted applicants from 2012 through 2017. Hanover uses these data to analyze the predictors of matriculation to WOU.

Hanover's analysis highlights factors that are predictive of enrollment at WOU and helps identify the relationship between students' demographic and academic profiles and the resulting probability of enrollment at WOU. This report comprises two sections:

- **Section I** provides an overview of the data through descriptive statistics of enrollment choice and available predictors. It also describes the methodology for the subsequent regression analysis, which examines the impact of the available predictors together.
- **Section II** presents the results of the regression models and discusses factors that are predictive of enrollment.

KEY FINDINGS

- **Admitted students are less likely to enroll at Western Oregon University as their pre-enrollment test scores and grades increase.**
 - Admitted freshmen students who have a one-point increase in average high school GPA are 30 percentage points less likely to enroll at WOU.
 - Similarly, students with a one-point increase from the mean ACT composite score are 1 percent less likely to enroll at WOU.
 - Admitted transfer students who have a one-point increase in average GPA are 4 percentage points less likely to enroll at WOU.
- **Admitted students who identify the major they plan to pursue are more likely to enroll at WOU than admitted students who have yet to decide on a major.**
 - For admitted freshmen students, those who selected a Criminal Justice major were roughly 11 percentage points more likely to enroll at WOU than those who had an undeclared major, and those who expressed interest in a Pre-Education major were 10 percentage points more likely to enroll.
 - Among transfer students, those who planned to enroll in Pre-Psychology were 5 percentage points more likely to enroll.
- **Admitted freshmen and admitted transfer students with more transfer credits are more likely to enroll at WOU.**
 - The minority of admitted freshmen with transfer credit hours were roughly 50 percentage points more likely to enroll than admitted freshmen with no transfer credits.
 - Among admitted transfer applicants, each additional transfer credit hour is associated with a 0.22 percentage point higher likelihood of enrolling.

- **Admitted freshmen students who can be classified as having a minority background are generally less likely to enroll at WOU.**
 - Admitted students who identify as Asian, Black or African American, or Hispanic, are between 5 and 8 percentage points less likely to enroll at WOU as freshmen when compared to white admitted freshman students.
 - Admitted freshmen with the status of Non-Resident Alien or Resident Alien are between 11 and 17 percentage points less likely to enroll at WOU when compared to admitted freshmen students with U.S. citizenship status.
- **Admitted students from Oregon are generally more likely to enroll at WOU than non-state residents.**
 - Except for admitted freshmen students from Hawaii, non-Oregon residents are between 12 and 19 percentage points less likely to enroll at WOU.
 - Admitted freshman applicants from Hawaii are about as likely to matriculate as Oregon applicants, although there are fewer applicants from Hawaii.

RECOMMENDATIONS

- **Western Oregon University should increase recruitment efforts toward specific student groups after notifying students they have been admitted to the University.**
 - Students with higher than average marks entering the University often select not to enroll at WOU. Increased efforts should be made to ensure a greater proportion of these students elect to enroll at the institution.
 - Students from minority backgrounds enroll at the University at lower rates than non-minority students with similar academic characteristics, specifically for freshmen admitted students. WOU should increase recruitment efforts toward admitted freshman students from minority backgrounds.
- **Targeted marketing and outreach to applicants with an interest in Criminal Justice or Pre-Education majors may produce higher returns because admitted freshman applicants who intend to major in these fields are more likely to enroll at WOU.**

SECTION I: DATA AND METHODOLOGY

Hanover analyzed the predictors of matriculation for Western Oregon University for the 2012 through the 2017 admission cycles. The following section describes the data construction and methodology used in completing the matriculation analysis.

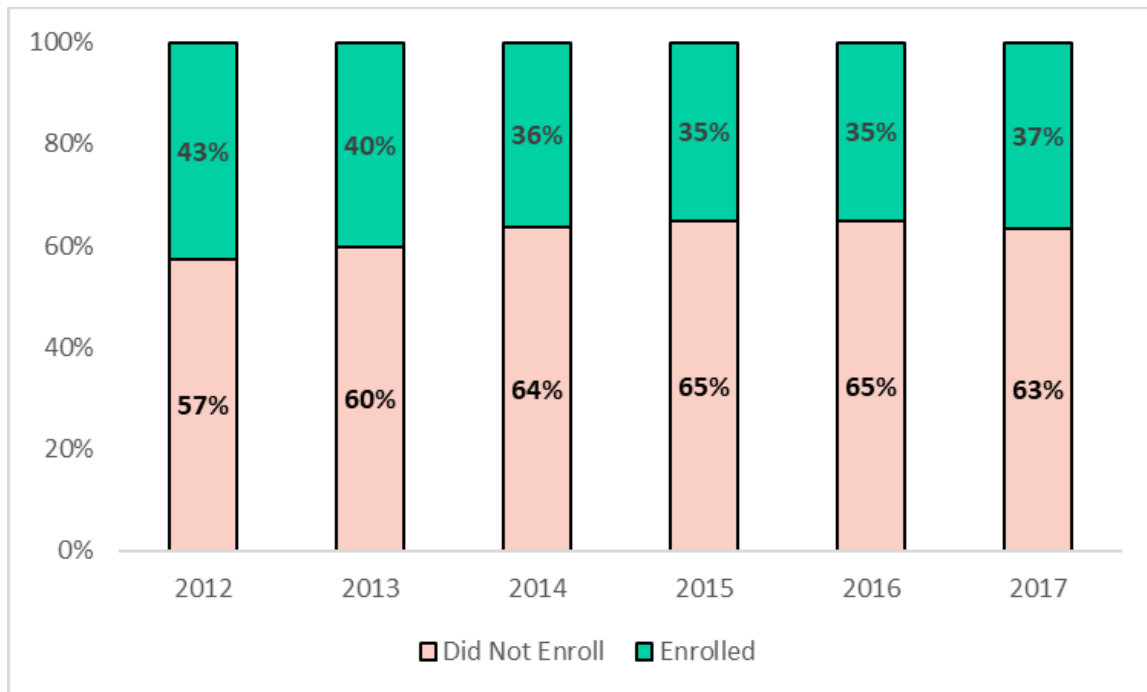
DATA OVERVIEW

To support this analysis, Western Oregon University (WOU) provided Hanover with student-level enrollment data from the 2012-2013 through 2017-2018 academic years.¹ The original datasets included students who applied to WOU, including those who were accepted to the institution. Due to the scope of this analysis and focus on matriculation, Hanover limited the dataset to only those students who were accepted to WOU. In total, the dataset includes 23,687 accepted students, of which 8,900 students elected to enroll.

DEPENDENT VARIABLE (OUTCOME)

After restricting the dataset to only those students accepted to the institution, Hanover further segmented the dataset into two distinct groups: those that subsequently enrolled in WOU and those who elected not to enroll in the University. Figure 1.1 illustrates the relative proportions of each group of students who applied over the six enrollment cycles.

Figure 1.1: Matriculation Rate by Year



Accepted Totals by Year – 2012: 3,778; 2013: 3,705; 2014: 3,879; 2015: 4,223; 2016: 4,187; 2017: 3,915

¹ In the rest of the report, we denote academic years by the fall term year (e.g., 2015-2016 is denoted 2015).

INDEPENDENT VARIABLE (PREDICTORS)

To model variation in enrollment choice among admitted students, Hanover used independent variables that describe students’ demographic characteristics and academic information, as seen in Figure 1.2.

Figure 1.2: Composition of Applicant Pool by Admission and Enrollment Status

VARIABLES	ADMITTED	DID NOT ENROLL	ENROLLED
Entrant Type			
Freshmen	76.40%	88.17%	60.69%
Transfer	23.59%	11.82%	39.30%
Gender			
Male	37.74%	36.55%	39.30%
Female	62.26%	63.45%	60.70%
Race/ Ethnicity			
American Indian or Alaska Native	1.82%	1.75%	1.90%
Asian	9.05%	8.62%	9.62%
Black or African American	4.11%	4.06%	4.16%
Hispanic	16.23%	18.63%	13.02%
Native Hawaiian or Other Pacific Islander	3.69%	4.11%	3.13%
Two or More Races	0.22%	0.23%	0.20%
White	60.74%	58.37%	63.91%
Unknown	4.15%	4.22%	4.06%
Citizenship			
Citizen	94.18%	95.51%	92.41%
Non-Resident	3.98%	1.81%	1.32%
Resident	1.60%	2.33%	6.18%
State			
California	8.42%	11.16%	4.77%
Hawaii	6.27%	7.58%	4.51%
Oregon	71.56%	68.09%	76.18%
Washington	5.70%	5.77%	5.60%
Other	8.05%	7.39%	8.93%
Observations	20,748	14,787	8,900

Generally, students enrolled at rates similar to their groups’ share of admitted students for the different variable categories. For example, about 62 percent of admitted students were female, while about the same share of admitted students who enrolled (61 percent) and did not enroll (63 percent) were female.

However, some categories display larger discrepancies between the proportions of admitted students and the shares who decided to enroll or not enroll. Most notably, freshman students account for more than 88 percent of students who did not enroll, but only about 76 percent of admitted applicants and 61 percent of enrolled applicants. This indicates that freshman applicants enroll at a much lower rate than transfer applicants.

While white students account for 58 percent of admitted students who elected not to enroll, they account for 64 percent of enrolled students. Hispanic students see the largest drop between the proportion of non-enrolled and enrolled students.

Similarly, while 67 percent of non-enrolled students are from Oregon, 76 percent of enrolled students come from the state. This is largely at the expense of admitted students from California, and to a lesser extent, from Hawaii.

Figure 1.3: Average Academic Performance by Admission and Enrollment Status

VARIABLES	ADMITTED	DID NOT ENROLL	ENROLLED
Student School Information			
ACT Composite Score	20.12	20.31	19.83
High School GPA	3.29	3.32	3.25
Credits Transferred	70.49	59.94	74.36
Transfer GPA	3.23	3.28	3.20
Observations	20,748	11,860	8,888

Students who were admitted but did not enroll at WOU had an average high school GPA of 3.32 compared to a 3.25 GPA for those students who were admitted and subsequently enrolled. Enrolled students also had lower average ACT composite scores. Admitted students who enrolled at WOU had an average ACT composite score 0.5 points lower than admitted students that did not enroll.

METHODOLOGY

To study the predictors of enrollment among admitted students, Hanover utilizes logistic regression models. While logistic regression models can show which factors are associated with enrollment when other observed characteristics are held constant, it is important to note that these models do not necessarily show causation.

When analyzing predictors of enrollment, we examine freshman and transfer students separately because these two types of entering students typically have different pre-enrollment data available and may approach the decision on whether to attend WOU differently.

Following the methodology described above, the results presented in this report are primarily based on each variable’s “marginal effect at the mean” (MEM), which shows the effect of each variable for the average applicant. The MEMs methodology uses the logistic regression (*logit*) model’s coefficients to calculate the instantaneous rate of change for a numeric predictor of enrollment for a student with an average value, essentially showing the effect of a one-unit increase in the predictor for the average applicant. In the case of categorical explanatory variables, MEMs estimate the change in an applicant’s predicted probability of enrollment for a given classification (e.g., male), compared to a reference category (e.g., female), while all other variables are held constant at their average.

SECTION II: LOGISTIC REGRESSION RESULTS

Below, Hanover presents the MEMs for both models discussed in the previous section. For each predictor, we present the estimated percentage point change in the likelihood of enrollment. This section highlights on key takeaways from Figure 2.1.

- **High School GPA** – The most predictive variable of student enrollment for freshmen is high school GPA. Students who have a one-point increase in average GPA are about 30 percentage points less likely to enroll at WOU, likely because higher-performing students have more competing offers of admission.
- **ACT Composite Score** – Like GPA, this variable is negatively associated with enrollment at WOU. A one-point increase from the mean ACT composite score results in a roughly 1 percent decrease in the likelihood of a prospective student enrolling at WOU. For example, a student who scored a 21 on the ACT would be 1 percentage point less likely to enroll than a student with a score of 20.
- **Transfer Credits** – Students with more transfer credits are more likely to enroll at WOU. For transfer students, each additional credit hour is associated with a 0.22 percentage point increase in the probability of enrolling (i.e., the probability of enrolling increases by 1 percentage point for roughly every five transfer credits an admitted transfer student has). The effect is more pronounced for the small share of admitted freshmen students with transfer credits; those with any transfer credits are roughly 0.5 percentage points more likely to enroll at WOU.²
- **Transfer GPA** – Admitted transfer students who have a one-point increase in average GPA from their previous institutions are almost 4 percentage points less likely to enroll at WOU.
- **Academic Major** – Compared to admitted students who were undecided on their major, admitted freshmen students who plan to enroll in a Criminal Justice major are about 11 percentage points more likely to enroll at WOU. Admitted freshmen who intended to major in Pre-Education were 10 percentage points more likely to enroll at WOU than undecided admitted students. Admitted transfer students who plan to enroll in Pre-Psychology are 5 percentage points more likely to enroll at WOU. Of note, admitted freshmen students who intended to major in Pre-Psychology are almost 4 percentage points less likely to enroll at WOU.
- **Athletic Scholarship** – Admitted students who received an athletic scholarship were between 24 percentage points (transfer students) and 61 percentage points (freshmen students) more likely to enroll at WOU than admitted students who did not receive an athletic scholarship.

² Note that transfer credits are split into three categories (none, 15 or less, and more than 15) for freshman applicants, since the vast majority (81 percent) of freshman applicants have no transfer credit hours. Credits for transfer students are included as a numeric predictor in order to measure the effect at a more granular level.

- **Racial/Ethnic Background** – Admitted freshmen students who identify as Asian, African American, or Hispanic are between 5 percentage points and 8 percentage points less likely to enroll at WOU than white admitted students. Admitted transfer students’ race and ethnicity showed no statistically significant differences in likelihood of enrollment.
- **Citizenship Status** – Admitted freshmen students who are either non-resident aliens or resident aliens are about 12 percentage points and 17 percentage points less likely to enroll, respectively, than those who are U.S. citizens. Among admitted transfer students, non-resident aliens are 23 percentage points more likely to enroll at WOU than U.S. citizens.
- **State of Residence** – Apart from admitted freshmen students from Hawaii, non-Oregon residents are between 13 percentage points and 18 percentage points less likely to enroll at WOU. Admitted applicants from Hawaii are about as likely to enroll as applicants from Oregon with otherwise similar characteristics. Among transfer students, all out-of-state students are less likely to enroll, though the effect is stronger for Washington and California than for other states.

Figure 2.1: Predictors of Enrollment

VARIABLES	PROBABILITY OF MATRICULATING	
	FRESHMEN ENTRANTS	TRANSFER STUDENTS
Student School Information		
ACT	-0.0094***	--
High School GPA	-0.2989***	--
Credits Transferred: 15 or less	0.4926***	--
Credits Transferred: More than 15	0.5841***	--
Credits Transferred (per credit)	--	0.0022***
Transfer GPA	--	-0.0372***
Major at Enrollment		
Business	-0.0092	-0.0191
Computer Science	0.0163	-0.0100
Criminal Justice	0.1088***	0.0317
Pre-Education (Teaching)	0.1017***	0.0224
Pre-Professional Studies	-0.0322	0.0632
Pre-Psychology	0.0364	0.0503**
Other	0.0375***	0.0084
Source of Enrollment		
ActiveMatch Plus	-0.0003	--
College Fair	-0.0178	--
High School Visit	0.0668	--
OPU Tour	-0.0110	--
Other	0.1463***	--
Unknown	0.0388	--
Athletics		
Received an Athletic Scholarship	0.6072***	0.2386***
Gender		
Female	0.0172	0.0067

VARIABLES	PROBABILITY OF MATRICULATING	
	FRESHMEN ENTRANTS	TRANSFER STUDENTS
Race/ Ethnicity		
American Indian or Alaska Native	-0.0054	0.0337
Asian	-0.0521**	0.0526
Black or African American	-0.0593**	-0.0079
Hispanic	-0.0779***	0.0033
Native Hawaiian or Other Pacific Islander	-0.0341	-0.0272
Two or More Races	-0.0158	--
Unknown	-0.0514*	0.0089
Citizenship		
Non-Resident	-0.1192**	0.2255***
Resident	-0.1627***	0.0312
State		
California	-0.1842***	-0.3004***
Hawaii	-0.0069	-0.1397*
Washington	-0.1289***	-0.2644***
Other	-0.1459***	-0.0883***
Year Fixed Effects	Yes	Yes
Number of Observations	12,190	4,663

NOTE: Statistically significant variables and categories are color-coded. Pink cells show significant negative predictors of student matriculation, while green cells show significant positive predictors. Statistically significant variables are denoted with *** p<0.01, ** p<0.05, * p<0.1

PROJECT EVALUATION FORM

Hanover Research is committed to providing a work product that meets or exceeds client expectations. In keeping with that goal, we would like to hear your opinions regarding our reports. Feedback is critically important and serves as the strongest mechanism by which we tailor our research to your organization. When you have had a chance to evaluate this report, please take a moment to fill out the following questionnaire.

<http://www.hanoverresearch.com/evaluation/index.php>

CAVEAT

The publisher and authors have used their best efforts in preparing this brief. The publisher and authors make no representations or warranties with respect to the accuracy or completeness of the contents of this brief and specifically disclaim any implied warranties of fitness for a particular purpose. There are no warranties that extend beyond the descriptions contained in this paragraph. No warranty may be created or extended by representatives of Hanover Research or its marketing materials. The accuracy and completeness of the information provided herein and the opinions stated herein are not guaranteed or warranted to produce any particular results, and the advice and strategies contained herein may not be suitable for every client. Neither the publisher nor the authors shall be liable for any loss of profit or any other commercial damages, including but not limited to special, incidental, consequential, or other damages. Moreover, Hanover Research is not engaged in rendering legal, accounting, or other professional services. Clients requiring such services are advised to consult an appropriate professional.



4401 Wilson Boulevard, Suite 400

Arlington, VA 22203

P 202.559.0500 F 866.808.6585

www.hanoverresearch.com