Risk Preferences, GPA, and Demographic Factors as Predictors in Student Course Selection

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Introduction

- The value of a college education is not simply the knowledge gained, but often includes the resulting employment outcomes for that individual. It is therefore important that students make course-selecting decisions that maximize their skillsets necessary for being successful in the workforce and the job market.
- There is very little research on why students select certain courses and it is a highly understudied topic (Babad, 2001; Babad and Tayeb, 2003).
- Studies have shown that, in addition to course quality, other factors come into consideration in the course selection process as well (Babad, 2001). One consideration in particular, ease, impacts course-selecting behavior, even though it is not directly related to the quality of the course. Another consideration, then, could be that students select courses according to their risk preferences, and the ease of a course should be relevant in this matter, especially when considering its effect on student GPA.
- This study aims to examine how course selection varies with risk preferences, GPA, and other demographic factors. We hypothesize that risk-averse students will be more likely to take easier courses, and that we will see a relationship between students' preferences for ease and their preferences for quality.

Methodology

A Qualtrics survey was administered to an introductory macroeconomics course for extra credit over a two-week period. The survey consisted of three parts:

1. Course selection procedure—similar to a study done by Babad and Tayeb (2003), but it modeled course selection options off of information provided by Rate My Professors on ease and quality of the course.
2. 5-trial adjusting probability discounting task—measured risk preferences in individuals to determine how risk-seeking/averse they were.
3. Demographics—collected gender, year in school, age, plans after school (e.g. industry), and GPA.

We received 652 responses during the specified period. After removing participants who didn't complete the course selection procedure, didn't follow the directions, or selected that they were not paying attention and did not wish to have their data included, 567 responses remained. Of the remaining participants, approximately 58% were female and the remaining 42% were male.

Imagine you are selecting an elective from your major.
Please select your top three choices out of the nine below. Level of difficulty is ranked from 1-least difficult to 5-most difficult. Overall quality is ranked from 1-least quality to 5-highest quality.

Option	Section	Level of Difficulty	Overall Quality
1	1256	4.5	4.5
2	4468	4.5	2.5
3	2764	4.5	1
4	3172	2.5	4.5
5	2467	2.5	2.5
6	3291	2.5	1
7	2785	1	4.5
8	3542	1	2.5
9	1724	1	1

Please select your top three courses based on level of difficulty and overall quality. Make sure to select three different courses.

1st Choice
2nd Choice
3rd Choice

This is the course selection procedure students completed.

What would you prefer?

- $50 for sure
- $100 with a 50% chance

Probability discounting task. After the first question, the probability adjusted up or down according to the student's response.

				EP50 (%) if last choice in:		h if last choice in:	
Index	Uncertain Choice	Odds Against	Trial No.	Certain	Uncertain	Certain	Uncertain
1	0.97	0.0309	5	0.03093	0.04443	32.33333	22.50679
2	0.94	0.0638	4				
3	0.91	0.0989	5	0.07945	0.11613	12.58600	8.61093
4	0.88	0.1364	3				
5	0.85	0.1765	5	0.15513	0.19682	6.44636	5.08083
6	0.82	0.2195	4				
7	0.79	0.2658	5	0.24156	0.29767	4.13975	3.35942
8	0.75	0.3333	2				
9	0.71	0.4085	5	0.36899	0.43842	2.71013	2.28092
10	0.68	0.4706	4				
11	0.65	0.5385	5	0.50338	0.57448	1.98656	1.74071
12	0.62	0.6129	3				
13	0.59	0.6949	5	0.65262	0.73892	1.53228	1.35332
14	0.56	0.7857	4				
15	0.53	0.8868	5	0.83472	0.94170	1.19800	1.06191
16	0.50	1.0000	1				
17	0.47	1.1277	5	1.06191	1.19800	0.94170	0.83472
18	0.44	1.2727	4				
19	0.41	1.4390	5	1.35332	1.53228	0.73892	0.65262
20	0.38	1.6316	3				
21	0.35	1.8571	5	1.74071	1.98656	0.57448	0.50338
22	0.32	2.1250	4				
23	0.29	2.4483	5	2.28092	2.71013	0.43842	0.36899
24	0.25	3.0000	2				
25	0.21	3.7619	5	3.35942	4.00470	0.29767	0.24971
26	0.19	4.2632	4				
27	0.16	5.2500	5	4.73092	5.92745	0.21138	0.16871
28	0.13	6.6923	3				
29	0.10	9.0000	5	7.76085	10.93487	0.12885	0.09145
30	0.07	13.2857	4				
31	0.04	24.0000	5	17.85657	24.00000	0.05600	0.04167

As a measure of risk preferences, *h* values were assigned based on the last choice in the probability discounting task (Cox and Dallery, 2016).

Results

In analyzing this data, we ran three regressions to model 1) variables in ease selections, 2) variables in quality selections, and 3) the relationship between selecting for ease and quality. As a robustness check, it was suggested that we run a separate regression on ease and quality selections to account for unusual choices.

xi: regress easerating logh i.gender year i.futureplans

	SS	df	MS
Model	3.033	5	0.607
Residual	146.750	558	0.263
Total	149.783	563	0.266

Number of obs	564
F(5, 558)	2.31
Prob > F	0.043
R-squared	0.02
Adj R-squared	0.012
Root MSE	0.513

easerating	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logh	0.015	0.047	0.33	0.741	-0.076	0.107
male = 1	0.088	0.044	2.00	0.046	0.002	0.174
year	-0.056	0.024	-2.36	0.019	-0.102	-0.009
industry = 2	-0.032	0.050	-0.64	0.520	-0.131	0.066
other = 3	0.076	0.068	1.12	0.263	-0.058	0.210
cons	1.891	0.056	34.03	0.000	1.782	2.000

xi: regress qualityrating logh i.gender year i.futureplans

	SS	df	MS
Model	0.495	5	0.099
Residual	68.310	558	0.122
Total	68.805	563	0.122

Number of obs	564
F(5, 558)	0.81
Prob > F	0.544
R-squared	0.007
Adj R-squared	-0.002
Root MSE	0.350

qualityrating	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logh	-0.047	0.032	-1.48	0.139	-0.110	0.015
male = 1	-0.001	0.030	-0.05	0.962	-0.060	0.058
year	-0.002	0.016	-0.15	0.883	-0.034	0.029
industry = 2	0.006	0.034	0.16	0.869	-0.062	0.073
other = 3	-0.059	0.046	-1.27	0.205	-0.150	0.032
cons	2.832	0.038	74.69	0.000	2.758	2.907

In these final models, ease and quality preferences were regressed against their *h* scores (risk preferences), year in school, gender, and future plans (graduate school, industry, or other. Only gender and year (specifically for ease preferences) proved significant in this analysis.

xi: regress easerating logh i.gender year i.dummy dummylogh dummygender dummyyear

	SS	df	MS
Model	9.190	7	1.313
Residual	141.128	558	0.253
Total	150.317	565	0.266

Number of obs	566
F(7, 558)	5.19
Prob > F	0.000
R-squared	0.061
Adj R-squared	0.049
Root MSE	0.503

easerating	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logh	0.361	0.148	2.45	0.015	0.071	0.651
male = 1	0.368	0.158	2.33	0.020	0.058	0.679
year	-0.171	0.081	-2.11	0.035	-0.331	-0.012
not "unusual" =1	-0.262	0.194	-1.35	0.177	-0.642	0.118
dummy*logh	-0.389	0.155	-2.51	0.012	-0.694	-0.084
dummy*gender	-0.312	0.165	-1.90	0.058	-0.635	0.011
dummy*year	0.126	0.085	1.49	0.138	-0.040	0.292
cons	2.140	0.185	11.54	0.000	1.776	2.504

xi: regress qualityrating logh i.gender year i.dummy dummylogh dummygender dummyyear

	SS	df	MS
Model	47.119	7	6.731
Residual	21.736	558	0.039
Total	68.854	565	0.122

Number of obs	566
F(7, 558)	172.8
Prob > F	0.000
R-squared	0.684
Adj R-squared	0.680
Root MSE	0.197

qualityrating	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logh	-0.149	0.058	-2.58	0.010	-0.263	-0.036
male = 1	-0.002	0.062	-0.04	0.971	-0.124	0.120
year	0.022	0.032	0.68	0.495	-0.041	0.084
not "unusual" =1	1.099	0.076	14.47	0.000	0.950	1.249
dummy*logh	0.121	0.061	1.99	0.047	0.002	0.241
dummy*gender	-0.002	0.065	-0.03	0.977	-0.129	0.125
dummy*year	-0.028	0.033	-0.85	0.396	-0.093	0.037
cons	1.810	0.073	24.87	0.000	1.667	1.953

A dummy variable was interacted with the other variables to see what effect "unusual" choices had on the data. Here, an unusual choice was defined to be selecting anything other than the highest quality option for the first course (7.41% of the sample).

Variable	Obs	Mean	St. Dev.	Min	Max
easerating	567	1.830	0.516	1	3
qualityrating	567	2.803	0.349	1	3
logh	567	0.390	0.466	-1.38	1.51
age	559	19.390	2.613	16	47
year	566	1.859	0.928	1	5
gpa	323	3.413	0.431	1.8	4

Future Plans	Freq.	Percent	Cum.
Graduate School	340	60.18	60.18
Industry	155	27.43	87.61
Other	70	12.39	100
Total	565	100	

Gender	Freq.	Percent	Cum.
Female	331	58.38	58.38
Male	236	41.62	100
Total	567	100	

Sample Demographics.

Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
15.34%	1.94%	1.94%	36.86%	0.71%	0.71%	40.39%	0.88%	1.23%

Distribution of first choice course selections.

regress easerating qualityrating

	SS	df	MS
Model	3.943	1	3.943
Residual	146.595	565	0.259
Total	150.538	566	0.266

Number of obs	567
F(1, 565)	15.2
Prob > F	0.000
R-squared	0.026
Adj R-squared	0.025
Root MSE	0.509

easerating	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
qualityrating	-0.239	0.061	-3.9	0.000	-0.360	-0.119
cons	2.501	0.173	14.42	0.000	2.161	2.842

Regression of ease preferences with quality. Here, preferences for higher quality correlate with easier courses.

Conclusions

- The evidence does not support the hypothesis that student course selection is correlated with risk preferences.
- In terms of selection for ease, males were more likely to choose harder courses and students tended to increase in their preferences for ease as they increased in year in school.

Future Directions

Future studies should attempt to:

1. Replicate these results and
2. Improve modeling the course selection process in order to better understand and study the factors that contribute to course selecting decisions

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