

How Well Do Students in Introductory Economic Literacy Courses Do in Upper Level Economics Courses?

The University of Toronto Model

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CTREE: June 1, 2017

1 Introduction

- Background: Economic literacy approach
- Background: Introductory Economics at the University of Toronto

2 Overview of the Data

3 Who takes which course? (all years)

4 Does it matter?

- Whether they take more Economics
- How they do

Introduction: The economic literacy approach

- Introductory economics courses provide graphical and mathematical tools majors need.
 - But vast majority of students who take no further economics waste time trying to master tools and concepts they will rarely use, and soon forget.
- Alternative, economic literacy approach focuses on shorter list of core concepts students can use for the rest of their lives, supplemented by active learning to pursue higher-level mastery.
- Gilleskie and Salemi: “The Cost of Economic Literacy: How Well Does a Literacy-Targeted Principles of Economics Course Prepare Students for Intermediate Theory Courses?” *Journal of Economic Education*, 43 (2), May 2012.
 - Show economic literacy courses still provide the preparation for upper-year courses if a student decides to major in economics.

Introductory Economics at U of T

- There are two streams of introductory economics at the University of Toronto:
 - ECO100Y, *Introduction to Economics*, is a full-year course combining principles of micro and macro.
 - ECO105Y, *Principles of Economics for Non-Specialists*, is a full-year economic literacy course also combining principles of micro and macro.
- Students must meet minimum achievement levels in ECO100Y or ECO105Y in order to continue in Economics or Commerce (RSM = Rotman School of Management).
- In addition to ECO, all intermediate economics courses (micro/macro/stats) require full year university calculus prerequisite with minimum 63%.

- For ECO100Y:
 - In F/W 2016-17, offered 5 sections of approximately 500 students each;
 - Two sections are devoted to Rotman Commerce.
 - Students must earn a minimum of 67% in order to take subsequent ECO courses, or enrol in ECO or RSM programs.
 - Instructors are free to use whatever textbook they want, but students write a semi-common final exam, with a common set of multiple choice questions (worth 25% of the final grade).

- Initiated in mid-1990s in response to concerns about high attrition in ECO100Y.
 - Why grind non-specialists through a “weeder course”?
- Early structure emphasized special topics, economic history, and a sketch of key economic models.
- Starting in 2011-12 (with Avi Cohen), the course moved to literacy-based focus on core ideas in economics.
 - In F/W 2016-17, offered 1 in-class section of 500 students and one on-line version with 300 students
 - Students must earn 80% in order to take subsequent ECO courses.
 - Students in some programs (especially International Relations) need this course, and can use it to meet prerequisite requirements in a limited number of ECO courses.
 - Textbook: *Micro/Macro Economics for Life*, Cohen (Pearson, 2015 [2011]), with MyEconLab.

Data

- Administrative data on all students who *finished* ECO100Y and ECO105Y
 - 2005-06 through 2016-17.
 - Linked to admissions records (e.g. Ontario high school);
 - Linked to other U of T course outcomes (first year MAT, subsequent ECO)

Sample Sizes

Number of sections	103
Number of sessions	23
Number of years	12
Number of Students	28,681
Excluding Summer	24,114
Excluding transfer credits	21,646

Student characteristics by course

Who takes which courses? (Pooled across years)

	ECO100	ECO105
Sample Size	14,694	4,257
% Female	49.6	54.7
% Canadian	62.8	80.8
% Non-English	43.8	23.2
% with ON HS Mark	71.0	74.0
ON HS Mark (average)	88.5	86.9
% of ON HS with Calculus	51.4	25.0
ON Calculus mark (average)	88.0	83.5

Note: Sample excludes summer and transfer students

ON HS = Ontario High school

Changes over time

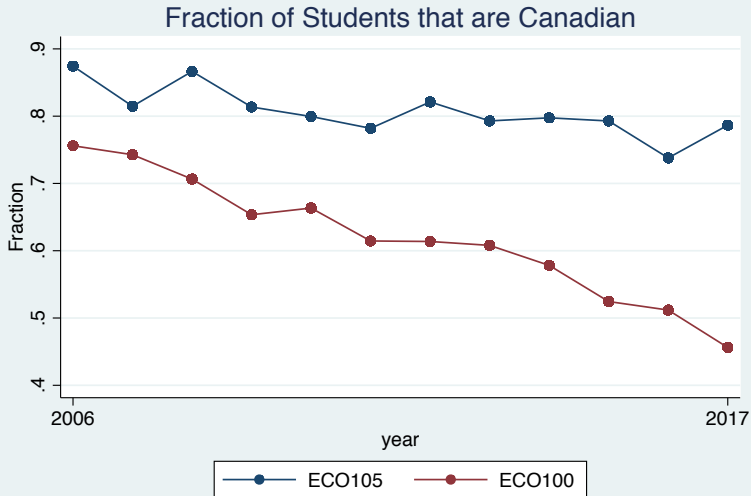
Who takes which courses: Pre- and "Post- Avi"

	2006-11	2012-16	2006-11	2012-16
	ECO100	ECO100	ECO105	ECO105
Sample Size	7,587	7,107	2,291	1,966
% Female	48.9	50.3	51.5	58.4
% Canadian	69.6	55.5	82.6	78.7
% Non-English	39.8	48.0	26.3	19.7
% with ON HS Mark	73.8	68.1	75.2	72.6
ON HS Mark (average)	87.5	89.7	86.3	87.6
% of ON HS with Calculus	31.9	74.0	19.1	32.1
ON Calculus mark (average)	87.0	88.5	84.0	83.1

Note: Sample excludes summer and transfer students

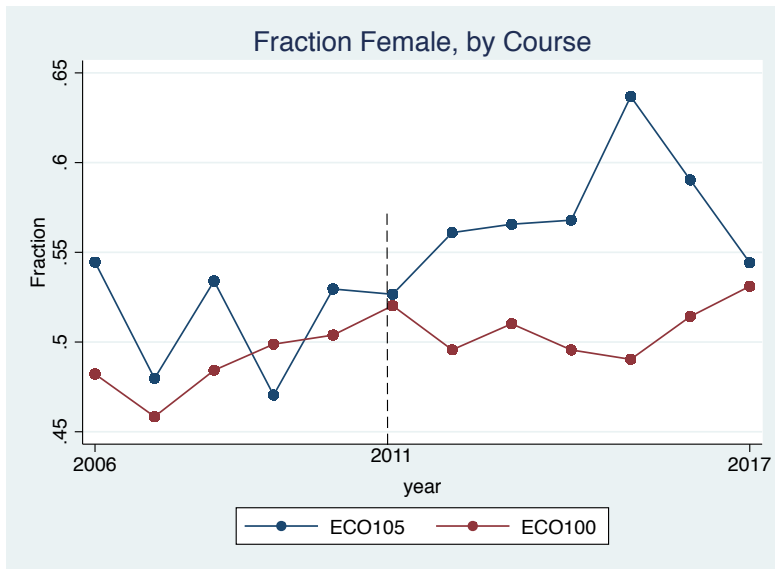
ON HS = Ontario Highschool

Changes over time: Fraction Canadian

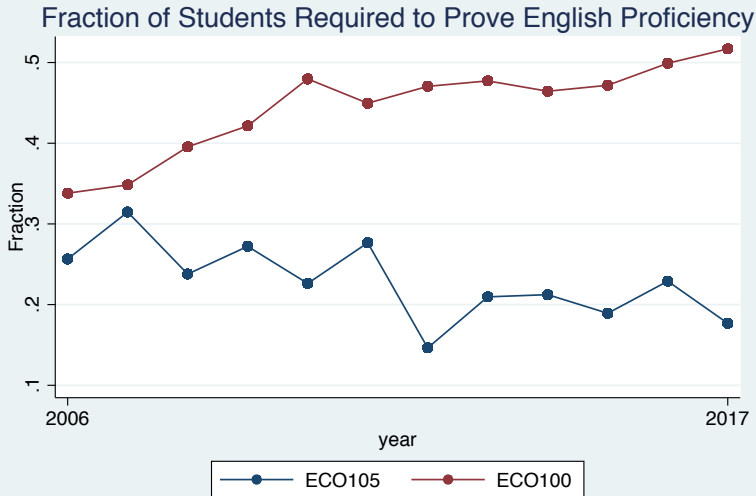


Sample: excludes Summer enrolments & Transfer Credits

Changes over time: Fraction Female



Changes over time: Fraction ELL



Sample: excludes Summer enrolments & Transfer Credits

Composition by intended stream of study

Distribution of Students, by Admission Stream (%)

STREAM:	All students*		All eligible students*	
	ECO100	ECO105	ECO100	ECO105
Rotman Commerce	41.5	1.0	51.2	0.7
Social Sciences	14.4	33.0	11.1	27.3
Humanities	10.4	29.4	6.7	24.5
Math and Physical Sciences	15.3	3.0	15.1	3.5
Life Sciences	5.9	15.3	5.3	22.8
Bachelor of Science	3.7	6.8	3.9	12.8
Computer Science	4.8	5.3	3.1	3.7
International Foundation Prog	2.5	0.5	2.4	0.1
Bachelor of Arts	0.9	2.5	0.9	2.7
Non-Degree	0.7	3.2	0.3	2.0
Total	100	100	100	100
Total (N)	16,066	4,531	10,805	1,585

*eligible = mark of 67+ in ECO100 or 80+ in ECO105

Note: Sample excludes summer and transfer students

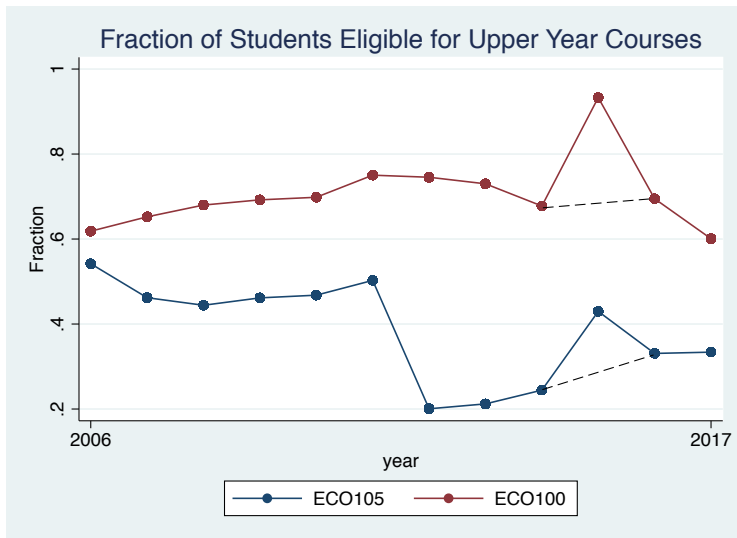
Which students do well in Intro Economics

VARIABLES	ECO105		ECO100	
	Pre-2012	Post-2012	Pre-2012	Post-2012
Female	-0.17 (0.67)	0.18 (0.57)	-1.73*** (0.35)	-1.28*** (0.32)
Canadian	2.81*** (0.93)	2.96*** (0.86)	1.55*** (0.43)	2.66*** (0.44)
English Required	5.45*** (0.80)	1.81** (0.86)	4.52*** (0.40)	3.09*** (0.43)
I(ON HS average)	-132.55*** (6.38)	-121.07*** (6.66)	-140.83*** (3.75)	-162.78*** (4.70)
ON HS Average	1.55*** (0.07)	1.34*** (0.08)	1.62*** (0.04)	1.75*** (0.05)
I(HS Calculus)	0.01 (0.07)	-11.00** (4.83)	-8.20** (3.57)	-7.82** (3.14)
HS Calculus mark	-0.51 (6.27)	0.17*** (0.06)	0.08** (0.04)	0.12*** (0.03)
Constant	68.10*** (1.07)	67.55*** (0.90)	66.36*** (0.51)	69.82*** (0.48)
Observations	2,291	2,462	7,586	8,745
R-squared	0.21	0.16	0.22	0.19

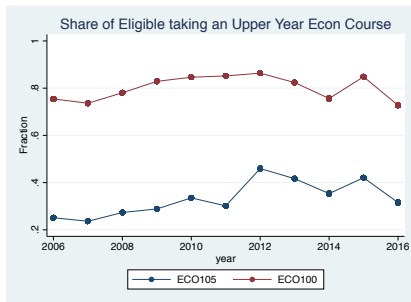
Standard errors in parentheses

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

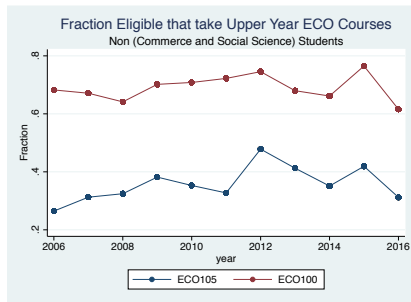
How many *can* take subsequent Economics courses



How many *do* take subsequent Economics courses



(a) All ECO1**



(b) Excluding Commerce

Which students take more Economics?

**Number of Eligible Students (by admission stream)
& Percent of Eligible Students that take any upper year course in Economics**

STREAM:	ECO100 N	ECO105 N	ECO100 %	ECO105 %
Rotman Commerce	5,530	11	87.18	63.64
Math and Physical Sciences	1,632	55	55.21	23.64
Social Sciences	1,196	433	69.57	39.03
Humanities	723	389	67.36	44.99
Life Sciences	576	361	58.69	15.27
Bachelor of Science	426	203	41.32	13.85
Computer Science	332	58	37.65	13.79
International Foundation Prog	264	2	63.64	100.00
Bachelor of Arts	95	42	70.53	42.86
Non-Degree	31	31	51.61	35.48
Total	10,805	1585	70.35	27.51

Note: Sample excludes summer and transfer students

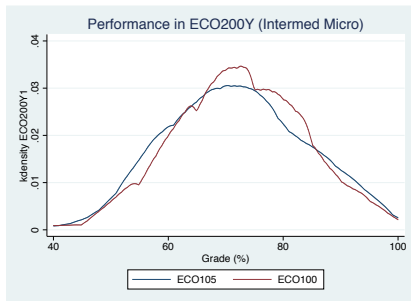
And what do they take?

Which courses do Eligible Students Take? (N)		
	ECO100Y	ECO105Y
ECO230Y1 (International)	288	312
ECO200Y1 (Intermediate Micro)	2117	169
ECO202Y1 (Intermediate Macro)	1571	130
ECO342Y1 (20th Century ECO History)	468	76
ECO220Y1 (Stats)	5164	73

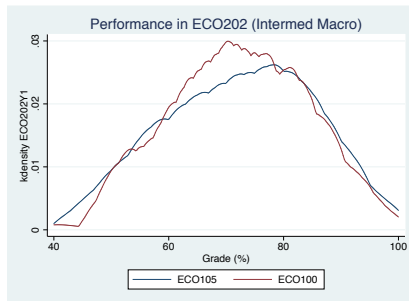
* restricted to eligible students (67+ ECO100; 80+ ECO105),
without eligibility restriction, 487 students take ECO230 after ECO105

Note: Sample excludes summer and transfer students

How do they do in subsequent intermediate courses?



(a) ECO200Y



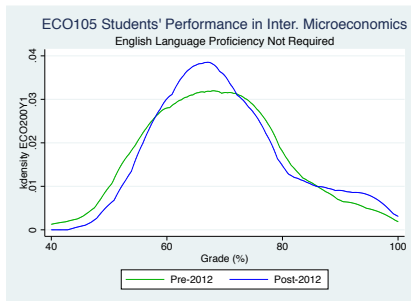
(b) ECO202Y

Average grades, by “eligibility” status

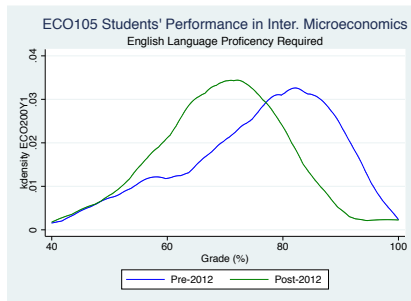
How do they do? Mean grade in ECO200Y & ECO202Y

	ECO100Y		ECO105Y	
	2006-11	2012-16	2006-11	2012-16
Inter. Micro (ECO200Y)	72.6	71.6	71.8	70.4
Inter. Macro (ECO202Y)	70.7	72.8	70.3	73.1

The importance of selection: English-language background



(a) English



(b) Non-English

Regression results: ECO200Y (Intermediate Micro)

VARIABLES	(1) ECO200Y1	(2) ECO200Y1	(3) ECO200Y1
ECO105	-0.61 (1.00)	-9.28*** (1.08)	-12.57*** (1.68)
Post-2012		-0.73 (0.48)	-0.67 (0.81)
ECO105xPost-2012		1.12 (1.74)	5.52** (2.59)
Eng. Prof. Required		1.64*** (0.52)	
Canadian		1.52*** (0.52)	
Female		0.92** (0.44)	0.98 (0.71)
ECO1** Mark		0.92*** (0.03)	0.95*** (0.05)
Constant	71.90*** (0.27)	0.34 (2.32)	-0.19 (3.72)
Observations	2,286	2,286	980
R-squared	0.00	0.31	0.29

Note: Column (3) sample restricted to Canadian (or permanent resident), English proficiency not required.

Regression results: ECO202Y (Intermediate Macro)

VARIABLES	(1) ECO202Y1	(2) ECO202Y1	(3) ECO202Y1
ECO105	-0.47 (1.32)	-9.79*** (1.58)	-12.49*** (2.49)
Post-2012		1.44** (0.67)	3.44*** (1.16)
ECO105xPost-2012		2.82 (2.47)	6.11 (3.72)
Eng. Prof. Required		1.33* (0.73)	
Canadian		0.48 (0.73)	
Female		1.46** (0.64)	1.90* (1.11)
ECO1** Mark		0.90*** (0.05)	0.92*** (0.08)
Constant	71.77*** (0.37)	1.76 (3.48)	0.38 (5.93)
Observations	1,701	1,701	639
R-squared	0.00	0.20	0.20

Note: Column (3) sample restricted to Canadian (or permanent resident), English proficiency not required.

Summary Observations

- Who takes ECO105?
 - Less mathematical; more humanities and social sciences.
 - More female, more English, more Canadian.
- Performance in Intro
 - High School background matters less in ECO105Y, but Calculus matters more post 2012 (than pre-Avi).
- Subsequent ECO courses
 - Important to account for “eligibility,” which was especially selective post-2012.
 - Conditional on eligibility, students slightly more likely to take subsequent ECO post-2012.
- Performance in subsequent ECO
 - Overall, ECO105 students perform comparably to ECO100 students in intermediate courses.
 - Conditioning on student characteristics, ECO105 students don't do quite as well (but less worse post-2012).
 - The effectiveness of the economic literacy approach strongly depends on English language skills.

Looking Forward

- Unanswered question for future research: Do economic literacy courses have “a detectable and positive impact on economic literacy”?
- “If our finding proves robust to variation in setting and instructor, then the profession should adopt the [economic literacy] principles course as its norm.”
- Why aren't we teaching introductory Economics in a Pareto efficient way?

Thank you!

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