

Examining the Impact of Economics Education on Young Americans' Attitudes about the Economy and Economic Institutions

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Abstract

Surveys have shown rising support for socialism among young adults. Responses indicate this shift could be due to a mistaken understanding of basic economics. We ask whether our students harbor the same beliefs, and if education in principles of economics changes students' beliefs. Our survey reveals that young adults in the US are not homogeneous. We also find a semester of economics has a significant effect on economic knowledge and beliefs regarding public policy. Basic economic education leads to a more accurate view of the economy and more optimistic view of the future, but these changes are only partly persistent.

JEL Codes: A00

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I. Introduction

Since 2000, Harvard University's Institute of Politics (IOP) has periodically administered the Survey of Young Americans' Attitudes toward Politics and Public Service. Recent editions display evidence that millennials and Generation Z view economics with increasing disfavor. Given that economic freedom is of paramount importance to society and that attitudes about free market institutions are closely tied to the institutions' longevity, the survey results are intriguing and alarming. When asked whether they support capitalism, most young Americans said they did not. Specifically, only 42 percent of recent respondents supported capitalism, while 33 percent supported socialism (Harvard IOP 2016). Interestingly, though, some results indicate that the respondents had an incomplete, incorrect, or

contradictory understanding of at least some economic concepts. This apparent disconnect suggests that a complete picture of basic economic terminology and theory may be absent in the lives of many young Americans.

Our research uses college Principles of Economics students as subjects for a pre- and post-exposure survey about economic knowledge and attitudes to see whether exposure to Principles of Economics impacts factual misconceptions and pessimism about free market capitalism. It also leverages surveys of a previously treated control group to gain insight about the longevity of any new knowledge and attitudes. Our hypothesis is that exposure to the study of economics will affect respondents' understanding of basic terminology, economic facts, and optimism toward the subject.

Results reveal basic differences in beliefs and economic attitudes between rural Southern students at a midsize public university and the broad sample of young Americans included in the national Harvard study. Although support for capitalism and disdain for socialism may be falling at the national level, our findings indicate this is not uniformly true across the country. The survey contains both objective questions (economic indicators) and subjective questions (attitudes and beliefs). We find that basic economic education leads to a more accurate view of the economy and a more optimistic view of the future, but this effect might not be permanent and might benefit from an occasional refresher.

Section 2 contains a review of relevant literature. Section 3 outlines the motivation for and methodology used in this study. Section 4 describes our data set and results of a number of statistical tests regarding the following issues. First, pre- and post-exposure results are analyzed for treatment and control groups to see whether knowledge and attitudes respond to economic education (the treatment). They did respond as expected. Second, responses from the end of the economics classes are compared to the beginning of the previously treated control group to see whether the improved knowledge and attitudes were retained. Results display signs of lost knowledge and attitude reversion. Third, responses from the beginning of the previously treated control group were compared to the beginning of the economics treatment group to see whether the reversion of knowledge and attitudes was complete—as if the economics instruction had never taken place. Results indicate that some knowledge and attitude changes are retained over time.

II. Literature Review

The general public does not believe the same things as economists about how the economy works (Caplan 2002). The public is overly prone to believe the economy is in decline, whether it is or not. These differences persist even after controlling for other factors such as differences in ideology, income, and political party (Caplan 2001, 2002). Nobel Prize-winning economist George Stigler noted the importance of these differences, stressing that citizens need full knowledge of all subjects in order for society to function at its highest level (1970). However, he was also keenly aware that this ideal situation is not a realistic one, as individuals are constrained by opportunity costs. Since one cannot have knowledge of all subjects, how much knowledge, if any, should the average citizen have of economics? Citizens should have some level of economic literacy in order to comprehend and voice their approval or disapproval of political legislation, which in most cases has economic implications (Stigler 1970). Basic economic literacy empowers citizens to understand incentives and apply appropriate discipline to rent-seeking elected officials (Schug and Lee 2012). Caplan and Miller (2010) find that disagreements between the general public and economists are larger than disagreements between intelligent non-economists and economists. They interpret this as evidence that, when the general public disagrees with economists, the economists are usually right and the public is wrong. Boettke (2017) points out the “plethora of popular fallacies that occupy the public imagination.” For years, media reports have reported that the economy is in shambles and getting worse, even at times when economic data indicate the opposite (Horwitz 2008). Common reported myths include that living standards are declining, the poor are getting poorer, and real wages are declining. Consequently, students show up to college with fundamental misconceptions and pessimistic attitudes about the motivations of businesspeople and about economic activity (Dove 2016). These formulations are often based on biased public opinions, perpetual political campaigns, and misleading or false statistical analysis (Hoffer 2014). Political campaigns’ interests are often at odds with the public’s economic interests and are reliable sources of misleading information to rationally ignorant, apathetic, and specially interested voters (Boettke 2010). Economic education about things like voluntary exchange, price controls, and protectionism is in the public interest and more important than ever. It also improves students’ ability to

think independently and critically about economic issues and fosters optimism about their own and society's futures (Horwitz 2008) and to make better policy decisions in Congress (O'Roark 2012).

Further, economic literacy has been tied to an appreciation for the importance of economic freedom. Economic freedom is linked to many social outcomes that ought to be important to citizens across the political spectrum. For example, political freedom has been closely linked throughout history to the existence of a free market economy. Indeed, economic freedom is a necessary condition for political and civic freedom, while socialism has been empirically tied to political repression (Lawson 2019; Friedman 1962). Szarka (2016) finds that economic freedom is empirically tied to civil liberties, some more than others. Hayek (1944) argues that economic freedom is the "prerequisite to any other freedom" and that democracy is only possible within a capitalist economic system. In many cases, economic freedom contributes to social justice, although social justice is often seen as antithetical to markets (Horpedahl et al. 2019). Economic freedom is tied to higher rates of education for women (and everyone) (Feldmann 2017), increased freedom of the press (Bjørnskov 2018), less corruption (Sandholz and Koetzle 2000), and improved nonmaterial quality of life across a broad set of measures such as community, trust, safety, and happiness, even after controlling for income (Nikolaev 2014).

Economic literacy is very important, so does economic education make a difference to an individual's knowledge and attitudes about economic issues? Kirchgässner (2005) finds it "extremely implausible" that formal study of economics would not impact student attitudes about markets and the economy. Gleason and Van Scyoc (1995) note that economics is an important part of political policies, but most voters have an imperfect understanding of the subject. Those that had previously taken a college economics course performed better on a test of general economics knowledge, but the difference is not large. Out of all the factors affecting economic beliefs, education has been found to be the most powerful (Caplan 2001). In fact, activities that lead to more economic freedom begin with an appreciation for markets and spontaneous orders (Lawson 2019). Vachris and Isaacs (2017) extend the work of Kuznets (1973) and McCloskey (2010) to link people's attitudes about economics to long-term economic and political freedom. Attitudes are critical because they affect the presence and health of institutions that are necessary to foster freedom, economic growth,

and prosperity (see also Buchanan [1966] 2001). Teaching the importance of spontaneous orders, the price system (especially), and voluntary exchange furthers public appreciation of these institutions (Boettke 2011, 2017).

Ridley (2017) points out that anticapitalistic and anti-economics attitudes often stem from misunderstanding of key terms. Due to the nature of the public discourse, the public is prone to conflate economics, capitalism, and free markets with crony capitalism, corruption, and asset-market crashes. Holcombe (2017) argues that this is, perhaps, the natural outcome of progress. Economic growth caused by capitalism leads to government growth, which pushes the well-to-do away from productive market activity and toward rent-seeking activity. This leads the next generation toward pessimistic, anticapitalistic rhetoric. Naturally, the public develops widespread complacency about declining economic freedom as well as increasing public debt and protectionism (Harrison et al. 2013). This outcome is not, however, inevitable. It does point to the importance of teaching and nurturing an understanding of the values and institutions that promoted the prosperity in the first place. When done correctly, economic education transforms students into critical thinkers, enabling them to recognize and hopefully prevent many misguided policies over a wide array of issues (Coyne 2010). Schug and Lee (2012) succinctly state the importance of the task: “If our youth do not understand enough economics to value and preserve free market institutions and the economic freedom they promote and protect, there is little chance that other worthwhile goals can be accomplished over the long term.”

Tests for years have indicated that young Americans lack a deep understanding of economics (Becker et al. 1990). This is unsurprising since most students only take an introductory survey of economics in high school or college if they take any economics at all, and many of those classes fail to emphasize private property, public choice, and spontaneous orders (Gwartney and Shaw 2013). There is a substantial body of research regarding the impact of K–12 economic education on knowledge and attitudes. These studies generally find positive but modest and partially temporary improvements in economic knowledge and optimistic attitudes following formal economic instruction (Walstad and Soper 1988, Walstad and Soper 1989, Hagedorn, Schug, and Suiter 2016, Schug and Hagedorn 2005, Suiter 2006, Niederjohn et al. 2010). Frey, Pommerehne, and Gygi

(1993) find that economic instruction did not alter student attitudes about the fairness of economic outcomes.

Perhaps college-level economics instruction is more impactful since students learn more economics if their teachers have more formal economic training (Watts 2005). Walstad and Rebeck (2002) note that adults who had taken college-level economics scored higher on economics tests. Walstad and Allgood (1999) find that college seniors who have taken economics do have statistically significantly higher scores on a knowledge-based exam than non-economics course takers. The overall amount of economic knowledge for takers of economics courses, however, is just above passing (at a D level). Gwartney and Shaw (2013) argue that exposure to traditional undergraduate economics courses is unlikely to improve economic attitudes or affect public policy in a positive way because the courses routinely underemphasize economic freedom and government failure. Conversely, King and King (2007) examine free market–student-group participation and find that economic education has a positive effect on student attitudes toward free markets. Caplan and Miller (2010) study the General Social Survey and find that economics-specific instruction might not matter as much as going to college in general since additional years of education improve cognitive ability. This raises intelligence test scores slightly, which is correlated with less pessimistic views about market mechanisms and the future of the economy. More educated individuals are particularly more likely to oppose protectionism.

III. Methodology

In the spring of 2016, the IOP at Harvard University conducted the twenty-ninth edition of the Survey of Young Americans' Attitudes toward Politics and Public Service. In the survey, 3,183 respondents ranging in age from eighteen to twenty-nine years old were classified as "young Americans." Some respondents are part of the millennial generation, while the youngest might be considered postmillennial or Generation Z. There is no single, universally accepted definition of these generational categories, but the Pew Research Center recently defined millennials as those born from 1981 to 1996 and Generation Z as those born from 1997 to 2012 (Dimock 2019). Whether the respondents were millennials or Generation Z, the survey provides insight into the hearts and minds of young adults in America today. The survey gathered information about political party affiliation, past election

engagement, future political movements or election participation, and feelings about broader concepts such as the direction of the country and general support for capitalism and socialism.

Results of the 2016 survey were intriguing and alarming. A majority of young Americans did not support capitalism (Harvard IOP 2016). Only 42 percent of respondents supported capitalism, while 33 percent supported socialism (Harvard IOP 2016). News articles published shortly after the survey recapped the economic situation that many of these young Americans had experienced throughout their lives. *Business Insider* gave an example of an individual born in 1996, who would have been twelve years old during the Great Recession. This hypothetical respondent's parents may have lost their job or home. Any new job may have come with lower pay and few to no benefits (Kendzior 2017). For these young adults, working may have been only about survival and never about getting ahead. The American Dream may have felt like a privilege reserved for older generations. Regarding the low levels of support for capitalism, the *Washington Post* noted that the term might not have the same meaning that it once did (Ehrenfreund 2016). For young people growing up in the 1960s through the 1980s, capitalism meant freedom from the Soviet Union or other totalitarian regimes, while those growing up in the 1990s and 2000s associate capitalism with the global financial crisis (Ehrenfreund 2016).

Interestingly, the Harvard IOP study reveals some conflicted views among young Americans. Although a majority did not support capitalism, which is often associated with free market principles and limited government intervention, a surprisingly low percentage supported government intervention to alleviate these problems (Ehrenfreund 2016). Specifically, just 27 percent believed the government should play a large role in regulating the economy, 30 percent believed the government should play a large role in reducing income inequality, and only 26 percent believed government spending was an effective way to increase economic growth (Harvard IOP 2016). This apparent disconnect suggests that a complete picture of basic economic terminology may be absent in the lives of many young Americans.

Using the Harvard survey as a framework, we designed a survey to examine whether knowledge and attitudes about politics and economics are sensitive to formal study of economics for young adults at our university. Our survey contains thirty-one questions, eight of which pertain to demographics, while the others gauge

economic knowledge, beliefs, and attitudes.¹ Principles of Macroeconomics and Principles of Microeconomics students serve as the treatment groups, while Business Statistics students serve as the control group. During the first day of the semester, the survey was administered in each class. Participation in the survey was completely voluntary, and there were no incentives, positive or negative, for students to participate. Student participation rates were quite high, however, and we are aware of no reason to believe the results suffer from serious selection bias. For example, the participation rate was just over 92 percent in the Principles of Macroeconomics course during one semester. Toward the end of the semester, the post-exposure survey was administered to the same classes. The response rates at the end of the semester are predictably lower, with the usual attrition and absenteeism that occur during an academic term. For the same Principles of Macroeconomics course, the post-exposure survey response rate was 72 percent. Pre- and post-exposure response rates were similar for all administrations of the survey.

During the three semesters in which the survey was administered in 2016 and 2017, one semester had Principles of Microeconomics as the treatment group while two semesters had Principles of Macroeconomics. Both are sophomore-level classes that are part of the general education curriculum, so there were students from many different majors present, and both were taught in a small auditorium with around one hundred students per section. For Principles of Macroeconomics, a neoclassical/Keynesian approach is used; it is taught from *Principles of Macroeconomics* by Coppock and Mateer. Content covered includes supply and demand, GDP, unemployment, inflation, economic growth, and fiscal and monetary policy. The Principles of Microeconomics section used Cowen and Tabarrok's *Modern Principles: Microeconomics*. The course, and the textbook, follows a standard neoclassical framework and is largely pro-trade and pro-free market without a great deal of discussion of downsides, disagreements, or limitations of this viewpoint, although market failures due to externalities and public goods are covered. Topics emphasized include opportunity cost, specialization and trade, supply and demand, tax incidence, market failure, public choice, market structures, and the price system versus central planning as the basis for an economic system. The Business Statistics class survey was

¹ The entire survey can be found at www.econgonecountry.com.

administered during all three semesters with about sixty students in each section. This is a junior-level course populated almost entirely by upper-division business students, and it is required for all business majors. The way the curriculum is structured, all the Business Statistics students took both Principles of Macroeconomics and Principles of Microeconomics already. The course is a basic statistics course applied to business situations, so it has no meaningful discussion of economic or political topics.

IV. Data and Results

A. Data

The Economics Attitudes survey was administered over three semesters in 2016 and 2017 in Principles of Economics (microeconomics and macroeconomics) and Business Statistics classes. The sample size is around one hundred for microeconomics and Business Statistics and around two hundred for macroeconomics, which included two sections. Most of the respondents are business majors of some kind (for example, accounting, marketing, economics) and mostly sophomores and juniors. The sample has less than 1 percent economics majors in Principles of Economics and only 3.4 percent economics majors in Business Statistics. Principles of Economics is 39 percent female, while Business Statistics is 44 percent female. As is typical of Middle and East Tennessee, a majority (84 percent) of the students are non-Hispanic white. The largest minority groups are Asians, followed by Blacks and Hispanics. Roughly 70 percent of the students come from nonmetro (rural) areas. Finally, in terms of political beliefs, the Principles of Economics and Business Statistics samples are very similar. Specifically, about 55 percent identify as Republican, 17 percent Democrat, and 28 percent independent.

Compared to the Harvard survey, our sample is similar in that it measures the economic attitudes of young Americans. Many of the questions from the Harvard survey are included our study. However, our sample is different from the Harvard survey in several important ways. The primary differences are that our respondents have a lower average age, have a higher level of education, and represent a more rural environment. With mostly sophomore and junior respondents, our respondents have an average age of roughly twenty, while 61 percent of the Harvard survey range in age from twenty-three to twenty-nine. Further, all the respondents in our survey have had some college education, while 40 percent of the Harvard sample

has a high school education or less. Finally, 70 percent of our sample identify as living in a rural area, while only 13 percent in the Harvard survey do.

B. Results

1. General

Do the differences in our sample lead to differences in responses regarding support for capitalism or socialism? Table 1 displays some general results from both the Harvard study and our pre-exposure survey. As previously mentioned, only 42 percent of the Harvard survey's respondents support capitalism, while the level of support among our students is just under 70 percent. In addition, 33 percent of the Harvard study's respondents support socialism, while only 20 percent our students do. Clearly, there are differences in beliefs and attitudes between our students and those surveyed by Harvard's IOP. Although support for capitalism and disdain for socialism may be falling at the national level, our findings indicate pockets of the population harbor different beliefs.

Table 1. National versus regional attitudes and beliefs

Question	Harvard	Principles: pre-test	Business Statistics: pre- test
<i>Do you support capitalism? (yes)</i>	42%	70%	69%
<i>Do you support socialism? (yes)</i>	33%	20%	20%
<i>I'll be better off than parents</i>	43%	49%	54%
<i>Easy/ very easy to find job after college</i>	31%	11%	8%
<i>Republican</i>	22%	55%	55%
<i>Nation is headed in the right direction</i>	15%	22%	28%
<i>Nation is off on the wrong track</i>	47%	35%	34%

Our students seem to not only have higher levels of support for capitalism but are also more optimistic about the economic prospects and general direction of the United States. For pre-Principles of Economics and pre-Business Statistics students, respectively, 49 and 54 percent believe that when they are their parents' age, they will be better off financially than their parents are now. In contrast, only 43 percent of the Harvard study's respondents hold the same belief. Further, compared to the national study, a greater percentage of our students believe that things are generally headed in the right direction in our nation and are less likely to believe that the nation is on the wrong track. These differences are likely due to differences in

prior education, the part of the country our students live in, and the fact that the students who have a preexisting interest in business also harbor more free market and business-friendly beliefs and are more optimistic about the future of our nation and economic prosperity than those in the Harvard study.

II. The effects of economic education

1. Pre-versus post-principles of economics

This section seeks to answer whether a semester of study in a Principles of Economics class significantly alters a student's economic knowledge and general feelings toward economic systems and institutions.

To test whether there are statistically significant changes in the proportion of responses that agree or disagree with survey questions before and after economic education, a test of equal proportions is implemented. The null hypothesis is that the proportion of those who agree or disagree is the same at the end of the class as it was at the beginning. To begin, equal proportions are tested for the pre- and post-exposure sections of Principles of Economics and Business Statistics. We also recoded the answers numerically from 1 (“Strongly Agree”) to 6 (“Strongly Disagree”), computed the mean score for each question, then tested whether the mean score was different at the end of the course compared with the beginning. The null hypothesis is that the mean score did not change. The difference-in-means tests do not vary importantly from the difference-in-proportions tests. Both are significant for the same courses at $\alpha = 0.1, 0.05$ and 0.01 . The microeconomics and macroeconomics sections are tested separately.

The two sections of Principles of Macroeconomics, fall 2016 and 2017, are combined to form one large group of Principles of Macroeconomics respondents. Similarly, the sections of Business Statistics from fall 2016 and 2017 are also combined to form one large control group for the macroeconomics semesters. Questions regarding economic and political knowledge and attitudes, numbers 8 through 31, are included in the test. The outcome for each question is either “Change” or “None,” with “Change” indicating that the null hypothesis is rejected and the proportion of responses in the post-exposure survey sample is different from that in the pre-exposure survey sample. For the control group, there is little evidence of significant differences in proportions between the pre-exposure and post-exposure surveys, though we observe changes regarding

questions on the unemployment rate and the social desirability of economic growth. It is difficult to explain why these changes occurred. It could be because part of the sample period overlapped with the 2016 general election, during which students may have been impacted by political advertising. Notably, change is noted in all four groups regarding the likelihood of voting in an upcoming election. This difference in proportions could be due to movements across campuses to get students to register to vote.

In the survey, some of the questions examine the respondents' knowledge of basic economic facts, while others are more normative in nature and reflect respondents' attitudes about the economy and the future. For example, question 16 states, "The unemployment rate is currently very high," which can be easily tested. In contrast, question 31 asks, "All in all, do you think things are. . .?" which is more subjective. For the Principles of Macroeconomics group, changes occur for both types of questions. Prior to the course, students were more likely to think that inflation had been rising rapidly in recent months and the unemployment rate was high. At the end of the course, students had a much more accurate view of the state of the economy. From fall 2016 through the end of 2017, the period in which the surveys were administered, the unemployment rate was below the natural rate, and inflation was consistently running below the Federal Reserve's 2 percent target. Students at the beginning of the class are more likely to believe that economic conditions are worse than they are, which is reflected in normative attitudes about the state and future of the economy.

For many Americans, global trade is viewed in a negative light and is considered harmful to America and a threat to its workers. A contemporary Gallup poll reports typical support for increasing import restrictions (Newport 2016). While many young adults in our survey were not against global trade prior to taking a macroeconomic-principles course, the course had a positive effect on their views regarding globalism. Question 11 states, "Global trade is good for the economy and consumers." A semester of Principles of Macroeconomics leads to a statistically significant change in the proportion of students who "Strongly Agree" or "Agree." It is similar for question 26, which states that "the negative trade balance between the U.S. and China is bad for Americans." A semester of macroeconomic education leads to a statistically significant change in the proportion of students choosing "True in some cases." The following panels display the percentage of each response in the pre-

exposure and post-exposure surveys for a few illustrative questions, focusing on whether the proportions changed significantly during the course. Then, table 2 summarizes the results of the hypothesis tests for all questions (significant at $\alpha = .1^*$, $.05^{**}$, $.01^{***}$). Some columns do not sum to 100 percent because of rounding or blank responses.

Question 10: US is falling behind other countries

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>		***				***		
<i>Strongly Agree</i>	10%	2%	4%	3%	6%	1%	2%	3%
<i>Agree</i>	24%	7%	19%	27%	13%	12%	15%	15%
<i>Somewhat Agree</i>	41%	29%	39%	35%	43%	39%	37%	31%
<i>Somewhat Disagree</i>	12%	20%	9%	16%	18%	25%	22%	28%
<i>Disagree</i>	12%	29%	27%	14%	19%	22%	19%	19%
<i>Strongly Disagree</i>	0%	13%	1%	5%	0%	1%	2%	4%

Question 11: Global trade is good

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>		***						
<i>Strongly Agree</i>	33%	35%	36%	36%	46%	49%	45%	39%
<i>Agree</i>	46%	51%	51%	47%	43%	43%	37%	49%
<i>Somewhat Agree</i>	17%	10%	10%	17%	10%	7%	14%	8%
<i>Somewhat Disagree</i>	3%	2%	2%	0%	1%	1%	1%	1%
<i>Disagree</i>	1%	0%	0%	0%	0%	0%	1%	1%
<i>Strongly Disagree</i>	0%	0%	0%	0%	0%	0%	0%	1%

Question 13: Inflation is currently very high

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>	4%	***	6%	1%	2%	1%	5%	3%
<i>Strongly Agree—1</i>	27%	2%	21%	14%	19%	17%	16%	15%
<i>.</i>	33%	12%	44%	44%	43%	37%	48%	43%
<i>.</i>	21%	28%	16%	25%	24%	27%	22%	24%
<i>.</i>	12%	32%	12%	13%	11%	14%	7%	15%
<i>.</i>	0%	24%	0%	3%	1%	1%	0%	0%
<i>Strongly Disagree—6</i>		3%						

Question 16: The unemployment rate is currently very high

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>	9%	***	3%	**	1%	1%	5%	6%
<i>Strongly Agree—1</i>	29%	3%	20%	1%	28%	17%	15%	15%
.	33%	7%	21%	10%	25%	23%	22%	26%
.	17%	16%	21%	34%	23%	30%	16%	31%
.	11%	29%	28%	26%	22%	24%	33%	19%
.	1%	38%	7%	21%	1%	3%	7%	3%
<i>Strongly Disagree—6</i>		7%		8%				

Question 23: Selfish individual behavior makes society better off

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>	3%	***	4%	3%	2%	***	1%	1%
<i>Strongly Agree—1</i>	8%	3%	7%	4%	9%	11%	10%	7%
.	13%	17%	15%	14%	15%	17%	15%	21%
.	21%	12%	16%	14%	18%	23%	15%	21%
.	35%	21%	34%	48%	38%	17%	39%	35%
.	19%	35%	22%	16%	18%	24%	17%	11%
<i>Strongly Disagree—6</i>		10%				6%		

Question 31: Direction of the country

	Treatment: Macro-economics		Control: Statistics		Treatment: Micro-economics		Control: Statistics	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Significant Change</i>	13%	***	17%	22%	39%	31%	44%	39%
<i>Right</i>	49%	37%	44%	33%	20%	19%	20%	21%
<i>Wrong</i>	37%	14%	37%	44%	40%	50%	35%	39%
<i>Not sure</i>		48%						

Table 2. Pre-exposure versus post-exposure proportion test

	Macroeconomics		Microeconomics	
	Treatment	Control	Treatment	Control
8. Support capitalism	None (0.250)	None (0.650)	None (0.702)	None (0.637)
9. Support socialism	None (0.876)	None (0.600)	None (1.000)	None (0.810)
10. U.S. falling behind other countries	Change*** (0.000)	None (0.877)	Change*** (0.000)	None (1.000)
11. Global trade is good	Change*** (0.000)	None (1.000)	None (0.597)	None (0.523)
12. President has substantial influence	Change*** (0.000)	None (0.292)	None (0.133)	None (0.196)
13. Inflation is currently very high	Change*** (0.000)	None (0.599)	None (0.696)	None (0.993)
14. Tech progress is good for economy	Change*** (0.000)	None (0.510)	None (0.130)	None (0.477)
15. Tech progress is good for environment	Change** (0.017)	None (0.852)	None (0.765)	None (1.000)
16. Unemployment is currently very high	Change*** (0.000)	Change** (0.043)	None (0.179)	None (1.000)
17. Historically, income tax rates are high	Change*** (0.000)	None (0.471)	None (0.562)	None (0.503)
18. Burden of income taxes falls only on workers who pay them	None (1.000)	None (0.196)	Change** (0.021)	None (1.000)
19. Gov't spending is an effective way to increase growth	Change*** (0.000)	None (1.000)	None (0.243)	None (0.828)
20. In general, I would be better off living in Norway	Change*** (0.002)	None (1.000)	None (0.870)	None (0.572)
21. Solid understanding of the USSR and the quality of life there	Change** (0.018)	None (0.153)	None (0.589)	None (0.594)
22. Economic growth is a desirable social goal	None (1.000)	Change** (0.021)	None (0.153)	None (0.881)
23. Selfish individual behavior makes society better off	Change*** (0.002)	None (0.672)	Change*** (0.009)	None (0.855)
24. Solid understanding of capitalism and socialism	Change*** (0.000)	None (0.172)	None (0.424)	None (0.588)
25. Gov't regulation of markets makes people better off	None (0.964)	None (0.195)	Change* (0.064)	None (0.202)
26. Negative trade balance is bad	Change* (0.073)	None (0.471)	None (0.967)	None (1.000)
27. When I'm my parent's age, I believe that I will be. . .	None (0.516)	None (0.564)	None (0.993)	None (1.000)
28. Difficulty of finding permanent job after graduation?	Change*** (0.001)	None (0.602)	None (0.672)	None (0.408)
29. How likely is it that you will vote in the upcoming election?	Change*** (0.000)	Change** * (0.000)	Change*** (0.000)	Change** * (0.000)
30. Which political party do you align with?	None (0.521)	None (0.875)	None (1.000)	None (0.969)
31. Direction of the country	Change*** (0.000)	None (0.115)	None (1.000)	None (1.000)

Note: p-values are in parentheses. Significant at: $\alpha = .1^$, $.05^{**}$, $.01^{***}$
 All treatment-group changes were in the expected direction.

Although students' beliefs about and knowledge of the US economy are altered after a semester of Principles of Macroeconomics, are their views on capitalism and socialism also

transformed? The null hypothesis of equal proportions of students responding “Yes” to questions 8 and 9 cannot be rejected. Interestingly, although there is a clear change in how students respond to various questions regarding economic principles and the state of the US economy, economic education does not produce statistically significant changes in how millennials and Generation Z in our study view capitalism and socialism. However, an overwhelming majority of students had positive feelings toward capitalism to begin with, so large changes may be unlikely even after a semester of economics.

The third column of table 2 illustrates the results of the proportion tests for Principles of Microeconomics and the corresponding Business Statistics control group for the spring 2017 semester. There are fewer rejections of the null hypothesis, which might seem curious at first. However, most of the questions in the survey are considered macroeconomics topics, so it is not surprising to observe fewer changes in attitudes and knowledge for the Principles of Microeconomics class. For the questions that pertain more to microeconomics, change is observed where it is expected. Last, the only question beyond propensity to vote in future elections that changes for both Principles of Microeconomics and Principles of Macroeconomics is whether selfish individual behavior makes society better off. After a semester of economic education, a greater proportion of students “Strongly Agree” or “Agree” that individuals acting in their own self-interest improves society.

2. Principles of economics versus business statistics students

Post-economics versus prestatistics

This section seeks to shed light on whether students retain the improvements in economic knowledge and attitudes gained during their economics classes. It appears that economic education influences students’ economic knowledge and attitudes. However, does the knowledge that students learn stick with them? To answer this, a test of equal proportions is used on the pre–Business Statistics and post–Principles of Economics students, with the macroeconomics and microeconomics students estimated separately. The null hypothesis is that the proportions agreeing and disagreeing should be equal between the two groups, which would be the case if students did not significantly lose the improved knowledge and attitudes gained in economics by the time they took the statistics course (a year or so later).

If the null hypothesis was true, we would expect to see very little difference between the two groups. The results of table 3 show this not the case. At least some of what students are learning may only be stored in short-term memory. When students are not currently learning about economics, their attitudes and beliefs revert to an inaccurate or more pessimistic state. For example, a significantly lower proportion of students in the pre-Business Statistics class “Disagree” or “Strongly Disagree” with the statement “The United States is falling behind other countries economically.” Similarly, a statistically significantly higher proportion of students in the pre-Business Statistics class choose “Off on the wrong track” in response to the question, “All in all, do you think things in the nation are. . .?” When it comes to macroeconomic indicators such as inflation or unemployment, it is understandable that Business Statistics students have a less accurate picture on the health of the economy since they are probably not actively tracking these indicators on their own time. However, one would hope to see little or no difference for questions regarding widely accepted economic principles such as whether global trade is good. Unfortunately, there is a statistically significantly higher proportion of post-Principles of Macroeconomics students that correctly agree with these statements, as compared to the Business Statistics control group.

A similar trend is observed for the statistics class when compared to the microeconomics class, although there are fewer microeconomics questions to examine. Regarding the statement that selfish individual behavior makes society better off, a statistically significantly higher proportion of microeconomics students agree. A higher proportion of microeconomics students disagree that the burden of a tax falls only on the workers who pay them. Interestingly, there are a couple of questions for which the null hypothesis of equal proportions is rejected, with statistics students having beliefs that more closely align with widely accepted economic principles than the treatment group.

Table 3. Post–Principles of Economics versus pre–Business Statistics proportion test

	Macro-economics	Microeconomics
8. Support capitalism	None (0.129)	None (0.512)
9. Support socialism	None (1.000)	None (0.734)
10. U.S. falling behind other countries	Change*** (0.000)	None (1.000)
11. Global trade is good	Change* (0.062)	None (0.168)
12. President has substantial influence	Change** (0.017)	None (0.676)
13. Inflation is currently very high	Change*** (0.001)	Change*** (0.000)
14. Tech progress is good for economy	Change** (0.017)	None (0.819)
15. Tech progress is good for environment	None (0.439)	Change** (0.016)
16. Unemployment is currently very high	Change*** (0.001)	None (1.000)
17. Historically, income tax rates are high	Change** (0.031)	None (0.540)
18. Burden of income taxes falls only on workers who pay them	None (0.152)	Change** (0.041)
19. Gov't spending is an effective way to increase growth	Change*** (0.000)	None (1.000)
20. In general, I would be better off living in Norway	Change** (0.032)	None (0.559)
21. Solid understanding of the USSR and the quality of life there	None (0.250)	None (0.501)
22. Economic growth is a desirable social goal	‡Change** (0.038)	None (0.119)
23. Selfish individual behavior makes society better off	Change*** (0.005)	Change*** (0.007)
24. Solid understanding of capitalism and socialism	Change*** (0.006)	None (0.724)
25. Gov't regulation of markets makes people better off	‡Change** (0.039)	Change* (0.052)
26. Negative trade balance is bad	None (1.000)	None (1.000)
27. When I'm my parent's age, I believe that I will be . . .	None (0.214)	None (0.771)
28. Difficulty of finding permanent job after graduation?	None (0.118)	None (0.311)
29. How likely is it that you will vote in the upcoming election?	Change*** (0.000)	Change*** (0.000)
30. Which political party do you align with?	None (0.664)	None (0.423)
31. Direction of the country	Change*** (0.000)	None (1.000)

* Note: p-values are in parentheses. Significant at: $\alpha = .1^*$, $.05^{**}$, $.01^{***}$

‡ Indicates test of equal proportions is rejected with greater proportion of control group (Business Statistics students) agreeing.

Pre-economics versus Prestatistics

This section examines whether the statistics students have lost all the improved knowledge and attitudes about economics and completely reverted to their pre-economics selves. The previous test of equal proportions compared the pre–Business Statistics to the post–Principles of Economics students. Under that comparison, it appeared that college students forget some information that they learn in their classes after a short period. However, this appearance

might be deceiving. When students are beginning to study for finals at the end of the semester (when the post-exposure survey is administered), their level of knowledge should be at its highest. This is particularly true for courses with a comprehensive final as in our Principles of Economics classes. It might be that the students in the control group have not forgotten all their economic knowledge, but just some of it compared to the students at the end of Principles of Economics. Therefore, a test of equal proportions is conducted for the pre-Principles of Economics and pre-Business Statistics students, the results of which can be found in table 4. If the Business Statistics students retain no knowledge long term, then the pre-Business Statistics students have reverted to their pre-Principles of Economics selves and we should be unable to reject the null hypothesis of equal proportions.

Table 4. Pre-Principles of Economics versus pre-Business Statistics proportion test

	Aggregate
8. <i>Support capitalism</i>	None (0.862)
9. <i>Support socialism</i>	None (1.000)
10. <i>U.S. falling behind other countries</i>	Change** (0.013)
11. <i>Global trade is good</i>	None (0.307)
12. <i>President has substantial influence</i>	None (0.114)
13. <i>Inflation is currently very high</i>	None (0.971)
14. <i>Tech progress is good for economy</i>	Change** (0.020)
15. <i>Tech progress is good for environment</i>	Change** (0.019)
16. <i>Unemployment is currently very high</i>	Change*** (0.001)
17. <i>Historically, income tax rates are high</i>	None (0.231)
18. <i>Burden of income taxes falls only on workers who pay them</i>	None (0.161)
19. <i>Gov't spending is an effective way to increase growth</i>	Change*** (0.001)
20. <i>In general, I would be better off living in Norway</i>	None (0.446)
21. <i>Solid understanding of the USSR and the quality of life there</i>	None (0.519)
22. <i>Economic growth is a desirable social goal</i>	None (0.122)
23. <i>Selfish individual behavior makes society better off</i>	None (0.963)
24. <i>Solid understanding of capitalism and socialism</i>	Change** (0.032)
25. <i>Gov't regulation of markets makes people better off</i>	Change* (0.089)
26. <i>Negative trade balance is bad</i>	None (0.116)
27. <i>When I'm my parent's age, I believe that I will be. . .</i>	None (0.101)
28. <i>Difficulty of finding permanent job after graduation?</i>	None (0.938)
29. <i>How likely is it that you will vote in the upcoming election?</i>	None (0.807)
30. <i>Which political party do you align with?</i>	None (0.852)
31. <i>Direction of the country</i>	None (0.939)

*Note: *p-values* are in parentheses. Significant at: $\alpha = .1^*$, $.05^{**}$, $.01^{***}$

The results of table 4 make clear that some economics knowledge is retained by students in the long term. A lower proportion of Business Statistics students agree that the unemployment rate is currently very high, for example. Business Statistics students appear to be more optimistic about the prospects of the American economy and the country itself. A higher proportion of students who have already taken courses in economics disagree with the statement that “the United States is falling behind other countries economically.” Finally, although no change is noted for support for capitalism or socialism, economic education does lead to a better understanding of these economic and political systems, with a statistically significantly higher proportion of students with economic education choosing “Strongly Agree” or “Agree” in response to the statement “I have a solid understanding of what the terms capitalism and socialism mean.” Although not all knowledge is retained by students, it is apparent that education in economics leads to better understanding of capitalism and socialism, better knowledge of the current state of the US economy, and more confidence in its long-term future performance. This is in accord with a bevy of prior research lamenting that economic principles are not taught early and often in K–12 education.

V. Conclusion and Limitations

Negative feelings about politics and the economy in the US appear to be particularly strong among young adults aged eighteen to twenty-nine, and most such respondents do not support capitalism (Harvard IOP 2016). In addition, it appears that many Americans, including millennials and Generation Z, lack fundamental knowledge of economic concepts, which is unsurprising given the well-documented lack of emphasis economics receives over the course of a typical education: one or two Principles of Economics classes often constitute an American’s entire economic education. We explored whether a semester of economic education affects knowledge of core economic principles and attitudes and whether any improvements are likely to remain in the long term.

Compared to their national peers, our respondents are overwhelmingly more optimistic about the future of the country and have more positive feelings surrounding capitalism but are also a demographically different group. We first examined the effect of one semester of economic education on students’ knowledge using hypothesis tests of differences in proportions. Students in Principles

of Economics courses show a statistically significant increase in answers that align with commonly held beliefs among mainstream economists, and they give more accurate readings of economic health. In addition, as one might expect, Principles of Macroeconomics students show more improvement for macroeconomics questions while Principles of Microeconomics students perform better on microeconomics content.

Previous studies have found that there is relatively little long-term retention of economic knowledge for those that have previously taken an economics course. We compared the post-Principles of Economics students to the control group and found results in accord with the literature: not all information is retained in the long term. However, we found that some amount of economic knowledge is retained in the long term for those that have previously taken a college economics course, at least for a year or two.

A significant limitation to this research arises from the anonymous nature of the survey. While the control group provides advantages over previous research, the lack of respondent identification prevents us from matching a respondent's post-exposure survey with his or her pre-exposure survey. Such matching would allow for substantially more confidence that the treatment is causing the change in knowledge and attitudes. It would be great to know, for example, whether the students who gained the most factual knowledge were the same ones experiencing the largest change in optimism. It would also allow us to remove students who drop the course midsemester or do not show up for the post-exposure survey from the pre-exposure survey pile. Ideally, students would be tracked and matched with their responses later when they are in the control group, drawing a more direct line to how much knowledge and optimism are regressing. This study is limited to comparing average responses for the classes, so it is less powerful.

There is growing concern in some places that support for capitalism is falling while support for socialism is rising. The shifts could be due to changing social norms, inequality, or a variety of other reasons, but it is thought a more economically literate public could help turn public opinion more in favor of free market principles. We find significant evidence of this at our school, even though the initial level of support for capitalism among students surveyed was higher than the national average. One semester of economic education was able to bring about a significantly better understanding of key macroeconomic indicators and an increase in

optimism regarding the prospects of future American growth and development.

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