

# Some Lasting Effects of Undergraduate Economics on Retirement Planning

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One important action that people take during their working lives to protect their financial future is to plan for retirement. An early indicator of people's willingness to plan for retirement is whether they establish a retirement account. Its creation can happen as a condition of employment through a 401(k), 403(b), and pension or as an independent initiative (IRA) unrelated to employment.

Financial literacy is likely to play a key role in retirement planning at all stages of life. In their extensive review, Lusardi and Mitchell (2014) define financial literacy as "people's ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions" (p. 6). Later in their review they cite and describe a number of research studies that show how financial literacy is associated with greater retirement planning (p. 25).

A directly related question is how people become financially literacy or acquire the useful financial knowledge and understanding for making informed financial decisions. The answer is of course a complex one involving

some unknown combination of education at different levels and life experiences. For college graduates, which is the target group for this study, their undergraduate education in economics is likely to be influential. Although most undergraduates do not take a separate course in personal finance, they do take courses in economics. Over half (54 percent) of all undergraduates who complete a college degree successfully complete at least one economics course (Bosshardt and Walstad, 2017). Further analysis shows that for some popular majors such as business, students complete about three economics courses and economics majors complete eight or nine courses.

At least one research study found that undergraduate economic education appears to have long-term and positive effects on people's economic and financial behavior. Allgood et al. (2011) used a comprehensive survey to collect data from 1976, 1986, and 1996 cohorts from four universities to study the effects of undergraduate coursework in economics on behaviors later in life. They found that economics majors saved more and thought saving for retirement or other purposes to be more important than other college majors.

This current study extends this line of research using a representative and more recent national sample of college graduates. The analysis, however, is limited to studying the likely effects of undergraduate economics on whether a college graduate has opened a retirement account four years after graduation. Economic education is measured by the number of credit hours a college graduate earned taking economics courses or whether a college graduate had majored in economics. Additional control variables for the logit analyses include occupation differences, employment record, and some demographics.

### **I. Data and Variables**

The analysis uses restricted-use data from the Baccalaureate and Beyond (B&B) study at the National Center for Education Statistics ([nces.ed.gov/surveys/b&b/](https://nces.ed.gov/surveys/b&b/)). It has data on approximately 17,170 transcripts from a nationally representative sample of U.S. undergraduates in the 2007–08 academic year.

One decision to be made was how complete a student's transcript had to be for it to be included in the analysis. The decision was a trade-off: the more complete the transcript the smaller the sample size (by about 40 percent for 100 percent completeness) and the less representative the sample. For this study, a transcript was sufficiently complete and usable

if it recorded more than 50 percent of the credit hours required for graduation and had no more than 30 credits that were not classified by discipline or subject matter. This rule produced approximately 15,010 transcripts for the credit hour and major analysis, or about 87 percent of all transcripts.

The transcript data were used to construct the key education variables for the study, which were either the number of credits earned in economics and business courses or college major. The B&B course codes 45.0601 to 45.0699 were used to calculate normalized credits earned in economics and codes 52.0101 to 52.9999 were aggregated to determine normalized credits earned in business courses. The B&B dataset includes a variable (rt11bac) classifying college majors into 11 groups for all students. A twelfth major (economics) was created for this study by separating it from its B&B placement with business and social science majors. What follows is a list of the twelve majors, with the percentages of students associated with each one stated in parentheses: business (23.5); computer science (2.4); economics (2.3); engineering (5.3); education (6.6); general studies (3.3); health care (7.8); humanities (14.9); industry or job training (5.1); science [physical, biological, and related sciences] (7.4); social science (15.8); and other applied fields (11.7).

The total percentage across majors is 106.1 percent because of double majors. They were defined as students who majored in two different categories from the set of 12 classifications. For the logit analysis reported later in this study each major in one of the 12 categories was coded as a (1,0) dummy variable. If a person double majored, it was coded (.5,0) for the first category for major and (0,.5) for the second category for a major.

The B&B study conducted a follow-up survey with these college graduates four years later (in 2012). One variable (b2cjocc33) coded their occupations using the Standard Occupational Classification of the U.S. Bureau of Labor Statistics ([www.bls.gov/soc](http://www.bls.gov/soc)). The 33 occupations were reduced to 11 to simplify the analysis and yet retain occupational diversity.

Slightly over four in ten college graduates were in a business occupation. The different jobs listed for it, however, was too broad so it was split. “Business management” covered positions such as managers, administrators, executives, and related support personnel (31.6 percent). “Business financials” focused on specialized occupations where financial and analytical training were used by workers such as financial analysts, appraisers, accountants, auditors, loan officers, cost estimators, claims adjusters, and tax preparers (10 percent).

College graduates in the sample worked in eight other occupations: education (15.3 percent); jobs using science, technology, engineering, and math (STEM) (10.8 percent); health care (9.6 percent); social services (6.6 percent); art and design (2.4 percent); legal and social science (2.3 percent); food services (2.3 percent); police and military (2.2 percent). The remaining college graduates (6.8 percent) were in the “not reported” category because a “legitimate skip” in the survey resulted in no occupation being reported for different reasons (e.g., not working in an occupation for at least three months, enrolled in further education, unemployed, or out of the labor force).

The B&B data set includes work-related variables. The mean income was \$39,150. The respondents also had different employment experiences in the 48 months since their graduation and when the follow-up survey was conducted, as shown by the average number of: (1) months in their current job (31.23); (2) total months unemployed since graduation (3.18); and, (3) total months out of the labor force since graduation (7.48).

The demographic data show an average age of 25.3 years old when a baccalaureate degree was awarded. The majority of the sample was female (57.4 percent). The sample had the following racial and ethnic mix: black (10.4

percent); Hispanic (9.2 percent); Asian (7.0 percent); and, white or other (73.4 percent).

Finally, one purpose of the follow-up survey was to ask what each graduate was doing about their retirement planning. Three variables were constructed related to responses about having a retirement account. The first variable (Retire) is a broad measure that is based on at least one yes response to the five questions in B&B survey about having *any type* of retirement account “either provided by an employer, your own savings, or a combination” (i.e., 401(k), 403(b), pension, IRA, or other). About 71 percent of the respondents had at least one of these retirement accounts. The second variable focused on the yes responses to having a 401(k) retirement account (46.1 percent). The third variable used the yes responses to whether an individual had an IRA account (25.5 percent). The reason for the interest in the distinction between the last two types of retirement accounts is that they may behavior differences. A 401(k) is often established by workers as a condition of their employment whereas an IRA is set up through independent initiative at any time and is generally unrelated to employment.

## II. Model, Credit, and Majors

The conceptual model for the analysis is as follows:  $R_i = f(T_i, O_i, E_i, D_i)$ , where for the  $i$ th college graduate,  $R_i$  = retirement account;  $T_i$  =

college transcript (represented by economics and business credit hours, and overall GPA, *or* 12 college majors and overall GPA);  $O_i$  = 11 occupations;  $E_i$  = employment (income, months in job, unemployed, or out of labor force); and,  $D_i$  = demographics (age, gender, race/ethnicity, marital status, and number of dependents).

The dependent variable  $R_i$  is dichotomous (0,1) so the empirical estimation was conducted with logit analysis. The marginal effects from the logit analysis are reported in the tables that follow with the standard errors in parentheses. When dummy variables for majors are included economics major is the omitted term. For the dummy variables for occupation business financials is the omitted term. Data for the analysis were available on about 11,770 graduates, or 68 percent of initial sample. It was reduced because not all graduates responded to the follow-up surveys.

In Table 1, the marginal coefficients are fairly similar across the three equations, so the type of retirement account is not an important distinction to study. For brevity, the discussion that follows focuses on the Retire estimates. The notable finding is that one credit hour of economics is positively and significantly associated with having a retirement account. By contrast, each credit hour a college graduate completed in business had no effect on having some type of retirement account.

TABLE 1— MARGINAL EFFECTS, ALL GRADUATES

Dependent Variable:	Retire	401(k)	IRA
T-economics credits	0.005 (0.002)	0.004 (0.002)	0.004 (0.002)
T-business credits	0.000 (0.000)	0.002 (0.000)	0.000 (0.000)
T-GPA	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
O-business management	-0.168 (0.021)	-0.158 (0.028)	-0.042 (0.023)
O-STEM related	-0.109 (0.026)	-0.018 (0.032)	-0.011 (0.027)
O-food services	-0.413 (0.055)	-0.393 (0.046)	-0.156 (0.038)
O-health care	-0.118 (0.025)	-0.178 (0.035)	-0.037 (0.029)
O-education	-0.171 (0.023)	-0.310 (0.030)	-0.050 (0.027)
O-police & military	-0.059 (0.039)	-0.376 (0.050)	0.030 (0.057)
O-social services	-0.205 (0.028)	-0.262 (0.034)	-0.088 (0.031)
O-legal & social science	-0.240 (0.046)	-0.228 (0.051)	0.009 (0.045)
O-artist & designer	-0.304 (0.048)	-0.335 (0.046)	-0.103 (0.047)
O-not reported	-0.049 (0.026)	-0.121 (0.045)	-0.024 (0.042)
E-income	0.004 (0.000)	0.003 (0.000)	0.001 (0.000)
E-months in job	0.001 (0.000)	0.001 (0.000)	-0.000 (0.000)
E-months not labor force	-0.003 (0.000)	-0.003 (0.001)	-0.002 (0.001)
E-months unemployed	-0.006 (0.001)	-0.005 (0.001)	-0.004 (0.001)
D-age	0.003 (0.001)	0.000 (0.001)	0.003 (0.001)
D-female	0.032 (0.012)	0.024 (0.014)	-0.029 (0.016)
D-Hispanic	-0.039 (0.023)	-0.046 (0.021)	-0.056 (0.024)
D-Asian	-0.046 (0.025)	0.011 (0.026)	0.001 (0.024)
D-black	0.019 (0.020)	-0.019 (0.022)	-0.047 (0.020)
D-married	0.067 (0.015)	0.047 (0.015)	0.085 (0.014)
D-# dependents	-0.005 (0.009)	0.010 (0.008)	-0.023 (0.008)
F-statistic	19.02	28.51	8.52

Another interesting result is from the estimates for occupations. Business financials is the omitted term, so relative to college graduates in this occupation, ones in most other occupations are significantly less likely to have opened a retirement account. The contrasts between occupational can be substantial. For example, college graduates who work in

business financials are about 41 percent more likely to have a retirement account than college graduates in food service occupations and 30 percent more likely to have a retirement account than college graduates in art and design. In addition, college graduates in business financials are 17 percent more likely to have a retirement account than are those employed in business management.

One probable reason for the occupational differences is that jobs in business financials attract college graduates who are prepared to analyze financial and other data, and understand the time value of money. In this respect, there is likely a residual contribution from undergraduate economics and its emphasis on data analysis and decision-making that make jobs in this occupation especially attractive. A quarter of economics majors work in business financials, but only ten percent of other college graduates do so. This dichotomy is not evident in the business management where the percentage of economics majors is about the same as all other college graduates (35 percent versus 32 percent).

A few other estimates are worth noting because they add insight and credibility to the results. As might be expected, income has a significant influence on whether college graduates have a retirement account. The probability increases by four percent for about

a \$10,000 increase. The relationship, however, is nonlinear so the change in probability will be less if the change in income is double. Employment record also matters. The more months employed in an occupation the more likely that college graduates will have a retirement account. By contrast, the more months college graduates do not work (due to being unemployed or out of the labor force) the less likely they will have a retirement account. Marriage too is good predictor of whether college graduates have retirement accounts, perhaps because marriage gets people thinking about their future, financial and otherwise.

One concern with the results in Table 1 is that the sample includes economics and business majors together with other majors, thus skewing the estimates in a positive direction for economics and business credits. When the economics and business majors are omitted from the sample, the significant and positive effect for economics credits still holds, but business credits essentially has no effect on having a retirement account. Table 2 reports the results for just these two variables, but omits the results for other variables because they are similar to those shown in Table 1.

TABLE 2—MARGINAL EFFECTS, NO ECON OR BUSINESS MAJORS

Dependent Variable:	Retire	401(k)	IRA
T-economics credits	0.008 (0.002)	0.006 (0.003)	0.007 (0.003)
T-business credits	-0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)

The other issue to investigate beyond course credits is how different majors are associated with having a retirement account. Table 3 shows the 11 variables for majors, with an economics major being the omitted term. The outcomes for the other variables (occupation, employment, and demographic) are not reported because they are qualitatively similar to those found in Table 1.

The negative signs for the coefficients for all majors in the Retire equation suggest that majoring in economics is more likely to be associated with having a retirement account. The differences, however, are significant only in comparisons with majors in the sciences, general studies, humanities, and applied fields. A similar advantage for economics over other majors is found in many comparisons in the other two equations, but the estimated effects are weaker and less consistent.

TABLE 3—MARGINAL EFFECTS WITH MAJORS

Dependent Variable:	Retire	401(k)	IRA
T-computer science	-0.082 (0.074)	-0.102 (0.072)	-0.047 (0.072)
T-engineering	-0.047 (0.079)	0.023 (0.066)	0.002 (0.064)
T-sciences	-0.129 (0.067)	-0.118 (0.061)	-0.074 (0.063)
T-general studies	-0.131 (0.065)	-0.115 (0.068)	-0.124 (0.070)
T-social sciences	-0.109 (0.062)	-0.093 (0.062)	-0.113 (0.058)
T-humanities	-0.128 (0.061)	-0.136 (0.062)	-0.116 (0.061)
T-industry or job training	-0.055 (0.064)	-0.063 (0.064)	-0.128 (0.067)
T-health care	-0.050 (0.064)	-0.107 (0.064)	-0.085 (0.069)
T-business	-0.066 (0.062)	0.006 (0.058)	-0.049 (0.057)
T-education	-0.031 (0.066)	-0.080 (0.065)	-0.077 (0.061)
T-other applied	-0.115 (0.059)	-0.108 (0.061)	-0.114 (0.059)

The results in Table 1 (or 2) and Table 3 make it difficult to determine which equation specification works best for estimating the long-term effects of undergraduate economics instruction. In either case, the outcomes are generally positive for economics. Although it may make sense to control for differences in majors, as shown in Table 3, it is more of a control for a qualitative characteristic than a quantitative one and can mask the influence of coursework in undergraduate economics on other majors as suggested by the credit hour estimates in Tables 1 and 2.

### III. Conclusion

The decision about whether to open a retirement account is likely to be influenced by occupational differences, employment history, and demographic variables. The logit analysis used in this study shows a relatively strong association between having a retirement account four years after college graduation and each factor. For example, the difference in probability of having an account can be as large as 40 percent for occupational comparisons, 10 percent for a \$25,000 difference in income, or 6 percent for being married instead of single.

What is surprising from the analysis, however, is that completing an undergraduate course in economics is significantly associated with having a retirement account. Although a

three credit course in economics increases the probability of having a retirement account by less than two percent, many college students take multiple economics courses and some major in the subject, so the long-term effects will be more substantial for them. There also may be indirect contributions from economics training because it may influence whether a college graduate chooses a job in an occupation such as business financials where workers are significantly more likely to have established a retirement account.

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