TRANSITION INTO ADULTHOOD: THE IMPACT OF THE GREAT RECESSION IN SCHOOLING AND FINANCIAL CHOICES OF YOUNG ADULTS

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ABSTRACT

The present research studies the impact the Great Recession (GR), on the education and financial choices of the young adults interviewed for Transition into Adulthood PSID Supplement TA - Panel Study of Income Dynamics. The study considers the effect of crisis on the ownership of both financial and real assets (stocks, savings, bonds and vehicles), as well as on college enrollment and change in educational plans. The empirical analysis is uses panel data (2005-2013). Results indicate that the GR impacted negatively the ownership of stocks and vehicles. By contrast, it had a positive impact on college enrollment while. The changes in educational plans due to GR are strongly and negatively predicted by the total assets ownership. Young adults who are white are more likely to own stocks, bonds and vehicles. The support received from parents and for tuition fees are positive and significant predictors of change in educational plans.

Keywords: *Great Recession; transition into adulthood; Panel Study of Income Dynamics PSID; financial behaviors; human capital investment; asset ownership.*

Acknowledgement: "The collection of data used in this study was partly supported by the National Institutes of Health under grant number R01 HD069609 and the National Science Foundation under award number 1157698."

Introduction

Transition into Adulthood is a process that has been studied in psychological, sociological and economic perspectives, but remains not well defined. From an economic perspective, it can be described as a process in which the school to work transition happens. For example, young adults leave high school and start to experience access to full time jobs. Moreover, adulthood is the point of their lives where they start gaining financial independence and establishing their own households (Bell, Burtless, Gornick, & Smeeding, 2007). Notwithstanding, some authors consider marriage and parenthood as requirements for adulthood (Amato & Kane, 2011) while others see this as a choice (Furstenberg, 2010; Settersten & Ray, 2010).

The Great Recession in US led to a drop in macroeconomic indicators such as GDP and the unemployment rate. Between the last quarter of 2007 and the first of 2009, GDP decreased at an average rate of 3.5%. The national unemployment rate increased from 5% in December 2007 to 9.5% in June 2009 (Bureau of Labor Statistics, 2012). The timing and impact of this economic decline differed across regions, families and individuals (Wartenberg, 2013). For example, American young adults fared poorly in comparison with the rest of the population (Friedline & Song, 2013). Indeed, because they are in a period of transition, young adults are very vulnerable to economic instabilities. First it is more difficult to become economically self-sufficient; second, young people generally have a low level of accumulated assets combined with high levels of debt to finance tuition fees and other necessary expenses (Modigliani & Brumberg, 1954); and finally they may need to change their educational plans due to changes in the labor market conditions.

When it comes to covering essential expenses that young people cannot meet, families might be a financial safety place to come back to or a place that makes it possible to

postpone the young adults' financial independence by delaying their move out (Friedline & Song, 2013). One of the main reasons for inability to meet essential expenses is the change in the labor market conditions for young adults. Indeed, the Great Recession became the main culprit for joblessness, with the young adults showing higher rates of unemployment (Jacobsen & Mather, 2011). In the labor market, young adults faced the challenge of being the first hired but also the first fired (Taylor et al., 2012). On the other hand, the Great Recession also brought an increase in high school, college and graduate school enrollment (Dwyer, McCloud, & Hodson, 2011; Wartenberg, 2013).

According to Elliott and Beverly (2011), in a highly competitive economy there is a high demand for post-secondary education. High school education is no longer seen as sufficient and for those that do not invest in further education, it is particularly difficult to attain "good" jobs (Kendig, Mattingly, & Bianchi, 2014; Oppenheimer, Kalmijn, & Lim, 1997; Oppenheimer, 2003). With the increasing importance of college graduation, young adults postpone their transition into adulthood in order to achieve higher qualifications. However, the high college costs combined with the high unmet need may contribute to disparities between college attendance and completion (Elliot III & Beverly, 2010).

This research aims to study the impact of the Great Recession on the education and financial choices of American young adults using the Transition into Adulthood (TA) supplements (for years 2005, 2007, 2009, 2011 and 2013) of the Panel Study of Income Dynamics (PSID). The study considers the effect of crisis on the acquisition of both real and financial assets, as well as on college enrollment status and change in educational plans. Each type of asset (vehicles, stocks, checking or savings account, and bonds) is tested independently due to the different levels of risk associated. Because the dependent

variable in all of the six models tested is binary, panel data and Probit models are adopted, and different specifications are tested.

This dissertation adds value in several aspects: (i) it tests the ownership determinants of different types of assets (financial and real) with different risk levels, following the methodology of Friedline and Elliott (2013); (ii) it uses a balanced panel data analysis, which makes it possible to compare the same individuals' decisions between 2007 and 2011, and to analyze the impact of the Great Recession on the ownership of real and financial assets, college enrollment status[1] ; (iii) as far as the author know, it tests for the first time the impact of the Great Recession on the educational plans of American young adults; and (iv) unlike previous research which includes mostly family and childhood variables, here the research considers primarily young adults' variables, which makes it possible to test some variables that were not considered before.

This dissertation is organized into four sections. *Section 1* will present a literature review on Transition to Adulthood. Here, it is listed the assets and debt accumulation, the educational choices and the impact of the Great Recession. *Section 2* characterizes the database used and presents the methodology. *Section 3* describes and discusses the empirical results. Lastly, *section 4*, presents the conclusion, limitations and suggests future research avenues.

[1] Only Hryshko, Luengo-Prago and Sorensen (2013) when testing the effect of education on equity ownership in the form of stocks or mutual funds, used a panel data, controlling for family fixed effects.

1. Transition to Adulthood: Literature Review

1.1.Transition to Adulthood and Life Cycle Transitions

There are numerous transitions that individuals face during their life cycle. Erikson (1976, 1982) was the first author that distinguished different phases in adulthood[2]. Daniel Levinson (1986) conceived life cycle as a sequence of four different eras which are divided in three different developmental periods since the beginning of a new era occurs with the approaching end of the previous one. The focus of this study is on the transition to adulthood, which comprehends the sixth and seventh stages defined by Erikson (1976, 1982), and the second era defined by Levinson (1986) (Figure 1).

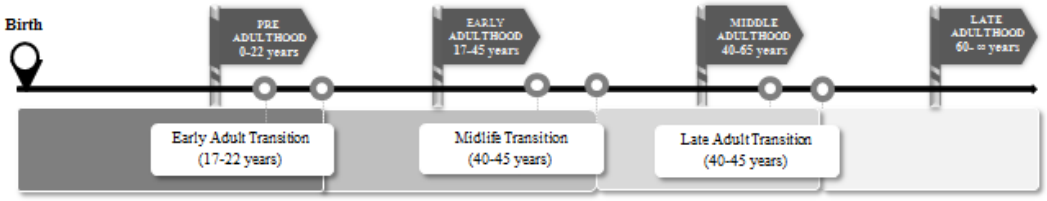

FIGURE 1 - Life Cycle Transitions

Source: Author's own figure based on Levinson (1986)

The transition that adolescents go through to adulthood is an extensive and gradual process for young Americans (Arnett, 2001). Some authors have conceptualized adulthood as achieving economic independence from family by completing school and getting a job, establishing households of their own and building their own families either through marriage, cohabitation or becoming a parent (Bell et al., 2007). Unlike their parents' and grandparents' generations who considered marriage and parenthood as requirements for adulthood, today young people view these as choices rather than requirements (Furstenberg, 2010; Settersten & Ray, 2010).

[2] More precisely, according to Erikson (1976, 1982) there are eight stages of transition: oral-sensory (years 0-2), muscular-anal (2-4 years), locomotor-genital (4–5 years), latency (5–12 years), adolescence (13–19 years), young adulthood (20–24, or 20–39 years), middle adulthood (25–64, or 40–64 years) and late adulthood (65 – death).

Financial independence is considered to be one of the main criteria for entering into adulthood (Arnett, 2000), and it is important not only for young adults but also for their families as young adults cannot stay forever in their parents' home. It is also important for the healthy development of a society. Financial independence is frequently associated with the acquisition of financial skills and resources, such as obtaining a post-secondary education and employment, and also with the establishment and maintenance of savings accounts and the acquisition of assets (Kim & Chatterjee, 2013). Given the increasing difficulty of having stable employment, many young adults rely on financial support from their parents and families (Schoeni and Ross, 2005; Xiao, Chatterjee, & Kim, 2014).

Since the period of transition for many young adults goes from the late teens to the late twenties, and because many students aged from 18 to 25 do not see themselves as already in adulthood, some studies consider the period between 18 and 25 years old as *emerging adulthood* (Arnett, 1997, 1998, 1999, 2000, 2001). Settersten and Ray (2010) argue that this period of emergence delays the real transition to adulthood for four reasons. First young adults need to be financially independent from their families to become adults. However, the number of young adults that return home or take more time to do that is increasing. Second, due to job instability and the fluidness of work careers, young people invest in education (e.g. going to college). Third, nowadays, due to changes in labor markets, it takes more time to find a secure full-time job that makes it possible to support a family on its own, and finally, all these changes lead to postponing marriage and parenting, which, in turn, delays the real transition to adulthood.

According to the guiding principles of the life-cycle hypothesis (LCH) within neoclassical economics (Modigliani & Brumberg, 1954), there is little reason to believe that young adults are able to accumulate assets early in their life course as a result of their

involvement in accumulating debt to achieve a number of goals such as investing in human capital, smoothing consumption over time or purchasing a home early in life (Guiso & Sodini, 2013). Young adulthood is the time in which low incomes are coupled with high consumption, which leads to low asset and high debt accumulation. Moreover, it is expected that when young family formation starts, most people's savings will be put into durable goods, and after that initial purchase, savings would flow into other kinds of assets. Therefore, asset accumulation starts once the income of young adults rises, and debts decline in middle adulthood. When people become older, due to their declining income post-retirement, they start spending the assets accumulated previously.

1.1.1. Asset and Debt Accumulation of Young Adults

"Assets and liabilities are fundamental to smoothing out consumption when income is volatile. Their insurance role is intertwined with the existence of and access to private or public insurance mechanisms. Indeed, wealth accumulation via "precautionary savings" is the primary means for households to self-insure against income decline" (Brandolini, Magri & Smeeding, 2010; p. 268). Although they are in the stage of life in which job losses occur frequently, when 'income is volatile', young adults still need to pay some expenses such as rent, tuition fees, student loan payments, utilities, credit card debts or car loans (Kim & Chatterjee, 2013). As a consequence, an increasing number of young adults are reporting financial debt and bankruptcy filing (Ensign, 2012; Rohrke, 2002).

Debt management is one indicator of financial literacy by young adults (Norvilitis, Szablicki, & Wilson, 2003), and many studies report that young people and those with less education commonly have poor financial behaviors or lack financial literacy (Murphy, 2005; Cole & Shastry, 2009; Fonseca, Mullen, Zamarro, & Zissimopoulos, 2012). It is likely that a large portion of young adults' accumulated debts is from student

loans, given the rising costs of higher education in the US where there is an increasing reliance on student loans (Elliott & Nam, 2013). Financial decisions are difficult, especially for young people, as they usually involve great uncertainty regarding the future and most young adults do not have the financial literacy required to responsibly make basic financial decisions (Chen & Volpe, 2002; Mandell & Klein, 2007; Lusardi, 2008; Mandell, 2008; Hira, 1993; O'Neill, 1993). This, combined with the desire for immediate gains, often leads young people to make mistakes in financial decisions (World Development Report, 2015).

Financial literacy among college students differs by gender: women are less knowledgeable than men about markets and investing (Chen & Volpe, 2002; Goldsmith & Goldsmith, 1997). Notwithstanding, in general, high levels of education correspond to better financial knowledge and savings behavior in young adulthood (Cole & Shastry, 2009; Lusardi, Mitchell, & Curto, 2010).

Young adults who hold greater accumulated assets are more able to face a personal financial crisis as accumulated assets can be an effective strategy for warding off short spells of income poverty, especially for those from lower-income households whose families may be unable to provide a financial safety net (Rank & Hirschl, 2010). Cagetti (2003) stresses that assets and savings are ways to protect the level of consumption, despite unexpected shocks. However, accumulated assets can also serve as a long-term tool in order to promote one’s development and human capital.

Poor people need to be more careful when it comes to taking financial decisions, as a decision can lead to profound consequences for them (Mullainathan & Shafir, 2009). People interpret the outcomes of financial prospects in terms of gains and losses. When deciding they tend to weight the losses more (Kahneman & Tversky, 1979; Wakker,

2010), which leads to a preference for investment in low-risk or no-risk assets (Guiso & Sodini, 2013). This behavior of loss aversion is often associated with a short-term focus on fluctuations (Benartzi & Thaler 1995; Gneezy & Potters, 1997).

Haveman & Wolff (2004) found that the individuals who were more likely to experience asset poverty were non-white, less educated, younger, not homeowners, and members of single parent families[3]. Caner and Wolff (2004), using the PSID data, found that young adults experience the greatest asset poverty, but this type of poverty decreases as individuals reached their 40s, 50s, and 60s. Rank and Hirschl (2010) added that those in early adulthood will experience asset poverty in terms of net worth, financial wealth, and liquid wealth. This is not surprising because, as Stuart Vyse (2008, p. 10-11) pointed out, "The combination of high levels of debt, no savings, and a strained household budget is a formula for disaster. Any sizable jolt, such as illness or loss of a job, can sink the ship, and for an increasing number of Americans, there are more than enough jolts to go around".

Summing up, due to the risk level associated with both bonds and stocks, a high investment is expected in savings accounts and vehicles, compared with risky assets. Moreover, because young adults are more involved in accumulating debt at this stage of their lives, it is expected that the difference between asset and debt accumulation (net worth) will be, on average, negative.

1.1.2. Human Capital Investment – Educational Choices

Campbell (2006), who have coined the term 'household finance' argues that the largest component of wealth for the majority of households is human capital which is

[3] Haveman and Wolff (2000) state that a household is considered asset poor if, for the period of three months, does not have sufficient net worth to sustain itself above the poverty line.

non-tradable. According to Becker (1964), education is an investment throughout an individual's life that influences the individual's productivity, and consequently, wages.

In comparison with the mid-century, in which a high school degree was enough to guarantee a solid standard of living, today it does not promise success (Settersten & Ray, 2011) and, for those young adults who do not invest in higher education, obtaining a good job is particularly difficult (Oppenheimer et al., 1997; Oppenheimer, 2003; Bell et al., 2007; Kendig et al., 2014). Moreover, young people who have not completed post-secondary education and young females have higher unemployment rates when compared to males who completed a post-secondary diploma (Ryan, 2001). As a result, young Americans started to invest in college degrees in order to attain higher standards of livings. Indeed, the return on this investment, i.e., the labor income, has a risk associated. Thus, both tradable and non-tradable assets have risks. The majority of the risk in labor income is idiosyncratic, and, as a consequence, unhedgeable, which leads households to invest more carefully. If it is perfectly correlated with traded assets, and households can short those assets, then labour income risk can be hedged and the effects of that on total portfolio can be undue (Bodie, Merton, & Samuelson, 1992).

College attendance and outcome can be predicted by different types of capital: social (Porfeli et al., 2009), cultural (Lareau, 2011), economic (Coleman, 1988), and human (Paulsen, 2001). Human capital is the focus of the present analysis. Social capital is directly related with the advantages entrenched in social relationships, and parents' involvement is considered the key factor for building it (Coleman, 1988). Academic outcomes are influenced by social capital (Coleman, 1988; Israel & Beaulieu, 2004; Porfeli et al., 2009). Culture capital, i.e., the attributes derived from parents, shows a connection to educational attainment (Bourdieu, 1986; Hart & Risley, 1999; Lareau,

2011; McDonough, 1997). Educational performance, high school graduation, and college attendance rates improve with the increasing resources that families make available to their children, so economic capital is relevant (Brooks-Gunn and Duncan, 1997; Coleman et al., 1966; Duncan et al., 1998; Yeung et al., 2002).

The relationship between human capital and the enrollment decision relies on the perception that the benefit exceeds the associated cost of attending school (Paulsen, 2001). Given that the costs associated with a college degree are high, the interest in undertaking training will occur if educational expenses are at least as profitable as financial investments (Cahuc, Carcillo, Zylberberg & McCuaig, 2014). Therefore, this can contribute to discrepancies between college attendance and completion, especially for adult children from low to moderate income households in comparison with those from high-income households (Haskins, 2008).

The relationship between college attendance and household assets has been studied by many authors (Charles et al., 2007; Conley, 2001; Destin, 2009; Elliott & Beverly, 2011; Haveman & Wolff, 2005; Huang et al., 2010; Jez, 2008; Nam & Huang, 2009; Williams Shanks & Destin, 2009). The variables used differ. All but one (Charles et al., 2007) include net worth, measured as total family assets minus debt. Some authors exclude home equity (Conley, 2001; Destin, 2009; Haveman & Wolff, 2005; Jez, 2008; Williams Shanks & Destin, 2009) as it cannot be easily converted into cash (Shapiro et al., 2009).

The empirical studies about the association between net worth and college attendance have produced mixed results. Some authors have found a positive relation (Conley, 2001; Destin, 2009; Williams Shanks & Destin, 2009; and Haveman & Wilson, 2007), but

others, when controlling for academic achievement, have found a non-significant relation (Jez, 2008; Nam & Huang, 2009; and Elliott & Beverly, 2011[4]).

Due to discrepancies between college attendance and college graduation, some literature has studied the relationship between assets and college graduation instead of attendance (Conley, 1999, 2001; Haveman & Wilson, 2007; Nam & Huang, 2009; Zhan & Sherraden, 2011). Only one study did not find a significant relation between assets and college graduation: Nam and Huang (2009). Zhan and Serraden (2011) found that liquid and non-liquid assets were positively related to college graduation for both white and black young adults, while income was not. Conley (1999) found a positive relation between net worth and college graduation but for income no association was established. Conley (2001) and Haveman and Wilson (2007) concluded the opposite regarding the relationship between income and college graduation.

In brief, despite the cautious investment in college education due to its high costs, the demand for college education is expected to continue. Therefore, the financial help received from young adults' parents is expected to be positively related to college enrollment.

1.2.The impact of the Great Recession

The Great Recession (GR) officially began in December 2007 and ended in June 2009 (Bureau of Labor Statistics, 2012). The impact on the American economy was significant. The revised estimates of the Bureau of Economic Analysis show that for the period of contraction, real GDP decreased at an average rate of 3.5%. The national unemployment rate increased from 5% in December 2007 to 9.5% in June 2009.

[4] Elliott and Beverly (2011) included parental savings, while not controlling for academic achievement. The first one found a positive relation between parents' savings for youth's college expenses and attendance at 2-year and 4-year colleges. The amount of those savings was only positively related with the attendance at 4-year college.

However, the G.R. did not affect everyone in the same manner, and, given their state of transition, young adults fared poorly in comparison with the rest of population in the U.S (Friedline & Song, 2013). The first and foremost reason has to do with the higher unemployment rates that young Americans face compared with other age groups. After reaching 12% in fall 2007, young men's unemployment increased from late fall 2008 until June 2009, when it was just over 18%[5]. Furthermore, those without a college degree were the most likely to experience job loss during the recession (Yen, 2011).

Taylor et al. (2012) show that between 2007 and 2011 young adults aged from 18 to 24 years old who were working full-time experienced the greatest decrease in inflation adjusted real median weekly earnings (6% between 2007 and 2011). Similarly, using data from young adults' aged 16 to 24 from the Current Population Survey (CPS) for the period between 2007 and 2010, Bell and Blanchflower (2011) also found that these younger employees had a decrease in median weekly earnings which was 3% higher than the decrease for older age groups in the given period.

The G.R. did not only mean a decline in young adults' employment rates and earnings; it also contributed to an increase in college attendance. The percentage of high school graduates enrolled in college increased from 60% in 1990 to 70% in 2009 (U.S. Census Bureau, 2012). Taylor et al. (2012) note that about 35% of young men and women report economic conditions as a major factor in their decision to go back to school. Moreover, young African Americans are more likely to report that they have gone to school as a result of hard economic times: 50% of African Americans versus 32% of Whites and 36% of Hispanics. This research suggests an increase in young adults' return to school for the years after G.R. However, it is also the point in young adults' life at which they may

[5] Bureau of Labor Statistics, 2012. Young adults are considered here to be those who born in the years 1980 and 1981 and thus were ages 25 to 26 by December of 2006 and were ages 28 to 29 by December 2009.

accumulate more debt that will burden them for the following years. The combination of these consequences leads to an increase in dependency on others and a postponement of young adults' autonomy, marriage and parenthood, leading to a delay in transition into adulthood (Taylor et al., 2012) as referred in Section 1.1. Not surprisingly, the percentage of young adults (aged 20 to 34) who lived with their parents rose from 17% in 1980 to 24% in the period of the G.R., especially for those under 25 years (Qian, 2012).

The combination of a long-enduring recession and high levels of unemployment might dim young adults' prospects for future expectations and goals. Yen (2011), reports that many college graduates declared waitressing, bartending or being involved in some other service industry position while they struggle for an entry-level career position to accept them. These young adults are sometimes called the recession's lost generation (Yen, 2011).

In short, the hard situation in which young adults were left with the G.R. is expected to have a negative impact especially on the ownership of risky assets. On the other hand, it is expected that the G.R. has created savings' habits in young adults in order to avoid passing through similar economic constraints later in their lives. Concerning education, I anticipate a positive impact of G.R. on college enrollment, mainly because the recession has left many young people unemployed, forcing many of them to return to school to try to achieve a more promising future.

2. Data, Sample, Variables Description and Methodology

2.1.Data base

This study used longitudinal data for 5 years (2005, 2007, 2009, 2011 and 2013) from the Transition into Adulthood (TA) Supplement of the Painel Study of Income Dynamics (PSID). The main reason for using American data, specifically from PSID, instead of

European is because PSID is the *longest running longitudinal household survey in the world*[6]. It is directed by faculty at the University of Michigan, who started in 1968 and have collected data every two years in the United States of America. They collect information about economic, social and health factors over the life course of 5,000 families and across generations (McGonagle et al., 2012). In 1997, the Child Development Supplement (CDS), which includes information about the children (0-12 years) of those families, was created. Information was collected again in 2002/2003, and in 2007/2008 all of the children under 18 years were also interviewed. In order to fulfil a gap that existed regarding the transition into adulthood of these youth that were interviewed for the CDS, in 2005 a new supplement - the Transition into Adulthood Study (TA) - was introduced to PSID. This supplement TA is a biennial study that includes young adults older than 18, who dropped out of high school, until they reach economic independence[7].

2.1.1. Subsample

The construction of the database used in this dissertation involved considerable work to collect, select and filter variables. It also involved harmonization across years/waves and the recoding of original variables as well as calculation of new variables among the variables included in TA supplements and the PSID core survey. Given that from year to year some variables are included or removed, it was necessary to carry out a very careful analysis and process of harmonization. Moreover, because the information available for 2013 is still preliminary (made available in February of the current year), it was necessary to keep in contact with the data collectors to clarify several points of the data. For the

[6] https://psidonline.isr.umich.edu/

[7] In the 2009 User Guide it is referred that the economic independence usually occurs around 25 years. However, in the most recent User Guide available (2011) it is not defined a normal age of TA abandonment.

modeling, STATA®v13.0 is used. The management and transformation of the different files is done using IBM SPSS® v22.0.

2.2. Description of Model Variables

2.2.1. Dependent Variables

Based on the research questions (see Introduction), six dependent variables are selected (*Table I*). Each one has two codes associated with it depending on if I am considering the probit models or the panel probit models. The probit models consider only the year of observation (*t*). By contrast, the panel models consider not only the year of observation (*t*) but also the individual (*i*), and they are marked by the subscript *it*.

TABLE I
DEPENDENT VARIABLES FOR YOUNG ADULTS FROM PSID AND TA (2005-2013)

Name	Description (see figure AI in the Appendix for the original questions in the survey TA /PSID)
Bonds *($bond_t$); ($bond_{it}$)*	=1 if young adults own any other savings or assets like money market funds, certificates of deposit, government savings bonds, or rights in a trust account; 0 otherwise.
Change in Educational Plans *($ceduc_t$); ($ceduc_{it}$)*	=1 if G.R. led to change young adults' educational plans; o otherwise.
Enrolment Status[b] *($enroll_t$); ($enroll_{it}$)*	=1 if young adults are enrolled in college; 0 otherwise.
Savings[a] *(sav_t); (sav_{it})*	=1 if young adults have a savings or checking account in their name; 0 otherwise.
Stocks *($stocks_t$); ($stocks_{it}$)*	=1 if young adults own any shares of stock in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or IRAs; 0 otherwise.
Vehicles *(veh_t); (veh_{it})*	=1 if young adults own any vehicles, including cars, trucks, or motorcycles; 0 otherwise.

(a) This variable is also used as an independent variable in (4) in section 2.3. For 2005 and 2007 it only includes savings accounts. After that, it is composed of savings and checking accounts.
(b) This variable is also used as an independent variable in (1), (2), (3) and (4) equations presented in section 2.3.
Source: Author's elaboration. These variables were recoded following the questionnaires and codebooks for all the years (exception year 2013 because there is no codebook yet).

The variable $ceduc_t$ is only available from 2009 onwards, and it is related to the impact of GR in young adults' educational plans. Four out of six measure whether young adults in those years owned different types of financial and nonfinancial assets or not. These assets included savings accounts (*savings*), *stocks*, *bonds* and *vehicles*. *Figure DI* shows the descriptive statistics for dependent variables.

2.2.2. Independent Variables

Based on the literature review (*Sections 1.1.1, 1.1.2* and *1.2*), sixteen independent variables of different kinds were used: demographic (age_t, age_t^2 $white_t$, $male_t$, $marr_t$ and $enroll_t$); social-economic status ($netw_t$, $lear_t$, $ccard_t$, $sloans_t$, sav_t, $tassv_t$, and emp_t) and family context ($psup_t$, $suptui_t$ *and* $mfeduc_t$). *Table II* describes them. For the panel data analysis, six additional variables are included: four for social-economic status ($nwbond_{it}$, $nwstock_{it}$, $nwsav_{it}$ and $nwveh_{it}$), and two to consider the years of GR and the period of post GR (rec_{it} and $prec_{it}$, respectively). The independent variables came from the five waves of TA with the exception of age (*age*), gender (*male*), and mother and father's education (*mfeduc*).

TABLE II
INDEPENDENT VARIABLES FOR YOUNG ADULTS FROM PSID AND TA (2005-2013)

Name	Description
Young adult characteristics	
Age *(age_t); (age_{it})*	Age of young adults, 17-34.
Age^2 *(age^2_t); (age^2_{it})*	Squared age of young adults.
Credit Card *($ccard_t$); ($ccard_{it}$)*	=1 if young adults carry any credit or store cards in their name.
Employment Status *(emp_t); (emp_{it})*	=1 if young adults are currently employed; 0 otherwise.
Gender *($male_t$); ($male_{it}$)*	=1 if young adults are male; 0 otherwise.
Log of Earnings *($lear_{,t}$); ($lear_{it}$)*	Annualized returns received in previous year (log form). Inflating to 2010 prices with the Consumer Price Index (CPI).
Married *($marr_t$) ($marr_{it}$)*	=1 if young adults are cohabiting or married; 0 otherwise.
Net Worth *($netw_t$); ($netw_{it}$)*	Total assets value (vehicles, stocks, bonds and savings) subtracted by the summed ownership of all debts (credit card debt and student loans).
Net Worth without bonds' value *($nwbond_{it}$)*	Total assets value (vehicles, stocks and savings), except bonds, subtracted by the summed ownership of all debts (credit card debt and student loans).
Net Worth without stocks' value *($nwstocks_{it}$)*	Total assets value (vehicles, bonds and savings), except stocks, subtracted by the summed ownership of all debts (credit card debt and student loans).
Net Worth without savings' value *($nwsav_{it}$)*	Total assets value (vehicles, stocks and bonds), except savings, subtracted by the summed ownership of all debts (credit card debt and student loans).
Net Worth without vehicles' value *($nwveh_{it}$)*	Total assets value (bonds, stocks and savings), except vehicles, subtracted by the summed ownership of all debts (credit card debt and student loans).

Name	Description
Young adult characteristics	
Student Loans ($sloans_t$); ($sloans_{it}$)	=1 if young adults have student loans.
Total Assets Value ($tassv_t$); ($tassv_{it}$)	Summed value of all assets owned (stocks, bonds, vehicles and savings).
White *($white_t$); ($white_{it}$)*	=1 if young adults are white; 0 otherwise.
Family charateristics and support	
Closeness to Father *($cfath_{,t}$); ($cfath_{it}$)*	Measures how close young adults are from their father or other relative, 1-7.
Mother and father education ($mfeduc_t$); ($mfeduc_{it}$)	Multiplication of mother education and father education.
Parents Support *($psup_t$); ($psup_{it}$)*	Financial help that young adults received from their parents, 0-6 (home purchase, rent or a mortgage payment, vehicle purchase, tuition covered, expenses or bills covered, personal loan).
Parents Support for tuition fees *($suptui_t$); ($suptui_{it}$)*	=1 if young adults received from their parents help to pay for tuition.
Great Recession Variables	
Post-Recession Period *($preci_t$)*	=1 if the year is between 2009 and 2013; 0 otherwise
Recession *(rec_{it})*	=1 if the year is between 2007 and 2009; 0 otherwise

Source: Author's elaboration. These variables were recoded by following the questionnaires and codebooks for all the years.

2.3.Methodology

The goal of this dissertation is to analyze the impact of the G.R. on the financial and educational choices of American young adults. Since the dependent variables are all binary, we used Probit models, divided in two phases. First we studied, through a Probit model (referred to as a non-panel Probit model) the factors that have an impact on the ownership of different assets, the enrollment status of young adults and the change in educational plans due to the G.R. Afterwards, the same factors were tested through panel Probit models, considering the same individuals and a period of analysis between 2007 and 2011.

In the probit models, the regressors, β_j, are estimated based upon the *Maximum Likelihood Estimation* (MLE). As a result, a direct interpretation of the coefficients cannot be made because here they only provide the signal of the regressor, i.e. positive or

negative. To interpret the results, a computation of the marginal effects at the mean was made. To pick the right model, the *Pseudo-R^2* (McFadden's) is considered because the larger it is, the bigger the *log likelihood* (Wooldridge, 2006).

TABLE III
SUMMARY TABLE WITH THE MODELS APPLIED

	Probit Models (by year)		Probit Models (Panel Data)	
	Equation	**Results**	**Equation**	**Results**
Stocks' Ownership	(1)	Tables BI, BII, BIII, BIV	(7)	Table III
Bonds' Ownership	(2)		(8)	
Savings	(3)		(9)	Table IV
Vehicles	(4)		(10)	
College Enrolment	(5)		(11)	
Impact of G.R. on Educational Plans	(6)		(12)	Table V

Source: Author's elaboration.

Concerning the ownership of financial and real assets, given that 4 different assets (vehicles, savings, stocks and bonds) are considered, 4 different models are tested.

$$P(stocks_t = 1|x) = \beta_0 + \delta_1 enroll_t + \delta_2 male + \delta_3 white_t + \delta_4 emp_t + \beta_1 mfeduc_t + \beta_2 psup_t + \beta_3 age_t^2 + \beta_4 age_t + \varepsilon_t \quad (1)$$

$$P(bonds_t = 1|x) = \beta_0 + \delta_1 enroll_t + \delta_2 male + \delta_3 white_t + \delta_4 emp_t + \beta_1 mfeduc_t + \beta_2 psup_t + \beta_3 age_t^2 + \beta_4 age_t + \varepsilon_t \quad (2)$$

$$P(sav_t = 1|x) = \beta_0 + \delta_1 enroll_t + \delta_2 male + \delta_3 white_t + \delta_4 emp_t + \beta_1 mfeduc_t + \beta_3 age_t^2 + \beta_4 age_t + \varepsilon_t \quad (3)$$

$$P(veh_t = 1|x) = \beta_0 + \delta_1 enroll_t + \delta_2 male + \delta_3 white_t + \delta_4 emp_t + \delta_5 marr_t + \delta_6 ccard_t + \beta_1 mfeduc_t + \varepsilon_t \quad (4)$$

For the enrollment status of American young adults, the model is:

$$P(enroll_t = 1|x) = \beta_0 + \delta_1 male + \delta_2 white_t + \delta_3 emp_t + \delta_4 marri_t + \delta_5 sav_t + \beta_1 mfeduc_t + \beta_2 psup_t + \beta_3 lear_t + \varepsilon_t \quad (5)$$

The present research also considers a variable that is derived from a question recently introduced in TA related to the impact of the G.R. on young adults' educational plans. The model is:

$$P(ceduc_t = 1|x) = \beta_0 + \delta_1 male + \delta_2 white_t + \delta_3 suptui_t + \delta_4 ccard_t + \delta_5 sloan_t + \beta_1 tassv_t + \beta_2 cfath_t + \varepsilon_t \quad (6)$$

Note that for 2013 there are many variables (e.g. *white*, *emp*, *mfeduc*, *lear* and *netw*) which are not yet available and others are available in the preliminary data, but, given that the codebook is not available yet, they are not useful. Therefore, the models presented in (1)-(6) need some changes (the above-mentioned variables must be excluded) in order to be used for 2013 data.

To compare the same individual's decisions through different periods of time (before and after the G.R), a panel data analysis is carried out. A balanced panel is built specifically for this research using data from the TA of years 2007, 2009 and 2011 to analyze two research questions: the individuals' behavior concerning the ownership of both financial and non-financial assets, and the college enrollment.

To study a different research question (the change in educational plans due to G.R), another panel was created, including only TA data for years 2009 and 2011, as these variables were included for the first time in 2009[8]. We started by applying the same regressions as those in section 2.3, but including the variables concerning G.R (*rec*) and one that translates the post-recession period (*prec*). We also tried the same regressions applied to risky assets (bonds and stocks) and non-risky assets (savings accounts and vehicle ownership). However, to avoid multicollinearity issues, we I adapted the traditional measure of wealth, *net worth* (total asset ownership less total liabilities), to each type of asset for the assets' panel regressions[9]. Therefore, all the models are different.

[8] Due to the erosion that panel data always have, 2005 will be excluded as it has a low number of observations. Regarding 2013, it is not included in the panel because there are relevant variables which are not available yet.

[9] When testing a specific asset (stocks, bonds, savings or vehicles), I consider all the value of assets excluding the one that I am testing.

As in the non-panel Probit regression, there are 4 different models for the 4 different assets (vehicles, savings, stocks and bonds), another one for enrollment status of American young adults, and the last one for the change in educational plans due to GR.

Considering stock ownership, the final model is:

$$P(stocks_{it} = 1|x) = \beta_0 + \delta_1 enroll_{it} + \delta_2 male_{it} + \delta_3 white_{it} + \delta_4 emp_{it} + \delta_5 rec_{it} + \beta_1 mfeduc_{it} + \beta_2 psup_{it} + \beta_3 nwstock_{it} + \varepsilon_{it} \quad (7)$$

The variables *age* and age^2, included in probit regression, were excluded because they were not statistically significant. As already mentioned, we decided to include the variable *nwstock* (net worth without including the stocks' value).

Taking into account bond ownership, the model applied was:

$$P(bond_{it} = 1|x) = \beta_0 + \delta_1 enroll_{it} + \delta_2 male_{it} + \delta_3 white_{it} + \delta_4 emp_{it} + \delta_5 prec_{it} + \beta_1 mfeduc_{it} + \beta_2 psup_{it} + \beta_3 age_{it} + \beta_4 age_{it}^2 + \beta_5 nwbond_{it} + \varepsilon_{it} \quad (8)$$

This model is closely related to the one applied for non-panel regression. Only the $nwbond_{it}$ (net worth, excluding the bonds' value), and $prec_{it,}$, which are the post-crisis period, are included. The variable rec_{it}, was not included because it has no statistical significance in any of the models tested until I achieved this one.

The model for savings is:

$$P(sav_{it} = 1|x) = \beta_0 + \delta_1 enroll_{it} + \delta_2 white_{it} + \delta_3 emp_{it} + \delta_4 marr_t + \delta_5 sloans_{it} + \delta_6 ccard_{it} + \delta_7 rec_{it} + \beta_1 mfeduc_{it} + \beta_2 nwsav_{it} + \varepsilon_{it} \quad (9)$$

The only variables added to the non-panel regression were the ones mentioned before (rec_{it} and $nwsav_{it}$). The variables male, *age* and age^2 were excluded because they did not show a relevant behavior with the bond ownership model tested individually for all the years.

Concerning vehicles, the estimated equation is:

$$P(vehicles_{it} = 1|x) = \beta_0 + \delta_1 enroll_{it} + \delta_2 male_{it} + \delta_3 white_{it} + \delta_4 emp_{it} + \delta_5 married_{it} + \delta_6 ccard_{it} + \delta_7 rec_{it} + \delta_8 prec_{it} + \beta_1 mfeduc_{it} + \beta_2 psup_{it} + \beta_3 nwveh_{it} + \varepsilon_{it} \quad (10)$$

Compared with the vehicles model tested independently for each year, this model only added variables related to parents' support ($psup_{it}$), net worth excluding vehicles' value ($nwveh_{it}$), effect of G.R. (rec_{it}), and post-Great Recession effects ($prec_{it}$).

The model that underwent the greatest changes in comparison with the one tested individually for all the years was college enrollment. The model[10] is presented below:

$$P(enroll_{it} = 1|x) = \beta_0 + \delta_1 male_{it} + \delta_2 emp_{it} + \delta_3 marr_{it} + \delta_4 rec_{it} + \delta_5 prec_{it} + \beta_1 mfeduc_{it} + \beta_2 psup_{it} + \beta_3 age_{it} + \beta_4 age_{it}^2 + \beta_5 netw_{it} + \varepsilon_{it} \quad (11)$$

The variables *white*, *sav* and *lear* were excluded because they showed no statistical significance in any the models tested previous to this one, and, in the case of *lear,* it the sample under study was significantly reduced. On the other hand, I included the variable net worth ($netw_{it}$), this time including all the assets values; age_{it} and age_{it}^2, because they become highly significant with the panel regression; and rec_{it} and $prec_{it}$ because both have significant results.

The last model estimated, this time considering a time horizon of only 2 years (2009 and 2011), is related to the change in educational plans due to G.R..

$$P(ceduc_{it} = 1|x) = \beta_0 + \delta_1 male_{it} + +\delta_2 enroll_{it} + \delta_4 suptui_{it} + \beta_1 tassv_{it} + \beta_2 netw_{it} + \beta_3 lear_{it} + \varepsilon_{it} \quad (12)$$

The similarity between this *ceduc* model and the one tested with a simple probit regression is little. The variables *white, ccard, sloan* and *cfath,* were excluded because they all had high p-values, and the $netw_{it}$ and $lear_{it}$ were included

3. Empirical Results and Discussion

The results are split in two different sections: one considering the results obtained with the probit models adopted for college enrollment, change in educational plans due to G.R, and ownership of real and financial assets; another section considering the Panel

[10] This model was also tested including the variable *ceduc*. In this case, the results are only for 2009, 2011 and 2013.

Probit Regressions' results, in which 2005 is excluded due to its low number of observations, and 2013 because it is a TA data preliminary version and some important variables are not yet included in the data base.

3.1.Probit Regressions Results

Risky Asset Ownership (stocks and bonds)

Tables BI to *BV* in the appendix show the equation results for the period 2005-2013. Young adults who received parental support (*psup*) are, for 2005 and 2013, more likely to own stocks. Age (*age*) impact is negative in 2005, which implies that with the age increase, young adults are less likely to own stocks. Employment status (*emp*) is a positive predictor of stock ownership in 2011, and bond ownership, except for 2005. These results suggest that, those young adults who are employed are more likely to own stocks. In 2013, those who are male (*male*) and enrolled in college (*enroll*) are 4.3% and 2.9% more likely to have stocks, respectively.

Non-risky Asset Ownership (savings and vehicles)

Tables BI to *BV* in the appendix show the estimated results for savings and vehicles, for all the years under analysis. Being employed (*emp*) and being in college (*enroll*) is positively associated with having savings accounts. Previous research has associated college enrollment with more accumulated savings (Friedline & Elliott, 2013; Friedline & Song, 2013) and found a positive relationship.

Credit card ownership (*ccard*), being married or cohabiting (*marr*) involves high probabilities of having a vehicle in their own name. Being a male (*male*) is also positively associated with having a vehicle (except for 2007). On the other hand, young adults who are currently in college (*enroll*) are less likely to have a vehicle.

Finally, note that race (*white*) emerges as one of the most consistent predictors of ownership of both young adults' financial and nonfinancial assets, except for 2013. The

results show that white young people (*white*) are more likely to own stocks, bonds, and vehicles (Friedline & Elliott, 2013; Bricker et al.,2012; Oliver & Shapiro, 2006), and they are more likely to have savings accounts (Friedline & Elliott, 2013; Friedline, Elliott, & Chowa, 2013; Friedline, Elliott, & Nam, 2011).

In addition, the combined education of mother and father appears as a significant predictor of financial and non-financial assets. Friedline and Elliot (2013) found that heads of households' education is positively related to stock ownership and negatively related to bond ownership. In the same way, Friedline, Elliott and Chowa (2013) found that heads of households' education is a significant predictor of young adults' saving accounts. Instead of this traditional variable, I use an interaction between the mother and father's education level (*mfeduc*). Our results point to a positive relation between stock, bond and savings ownership and parents' education and a negative relation with vehicle ownership. Regarding bond ownership, the result is contrary to that obtained by Friedline and Elliot (2013), but this may be because those authors consider head of household's education while I use the combined education of both mother and father (*mfeduc*). ***College Enrollment, Great Recession and Change of Educational Plans***

The majority of previous research considers both college attendance and graduation (Charles et al., 2007; Conley, 1999, 2001; Destin, 2009; Elliott & Beverly 2011; Haveman & Wolff, 2005, 2007; Huang et al., 2010; Jez, 2008; Nam & Huang, 2009; Williams Shanks & Destin, 2009, Zhan & Sherraden, 2011). While the college attendance variable represents those *who had ever attended* college, graduation takes into account young adults who *have a college degree*. College enrollment (*enroll*) is used in the present research as a proxy for those young adults who are *now* ('now' means at the time of the TA survey) in college.

The results for college enrollment are in *Tables BI* to *BV* in the appendix. The mother and father's education (*mfeduc*) appears to be one of the most consistent positive predictors of college enrollment. This result is in line with Elliott and Beverly (2011), who identified household head's education as a predictor of college progress. They also found that females are more likely to be on course, which is in line with our results for 2005, 2011 and 2013. Conley (2001), when testing the predictors of college graduation, found that females are more likely to have a degree. When the impact of the G.R. on schooling choices is considered an independent variable (*ceduc*), this result is also obtained for 2011 and 2013.

Many authors have found that the family Net Worth (*netw*) is positively related with college attendance (Conley, 2001; Destin, 2009; Williams-Shanks & Destin, 2009; Haveman & Wilson 2007; Nam &Huang, 2009; Elliott, 2008; and Morgan & Kim, 2006). Huang et al. (2010) found mixed results for net worth. Because we did not consider family variables, except for the education of mother, father or relatives (*mfeduc*), we considered only the young adults Net Worth (*netw, nwstocks; nwbond; nwsav; nwveh*). We found a negative relation which can be explained considering the life cycle theory. Young adults accumulate higher levels of debt. Given this, the *Net Worth* (*netw*), i.e., the total value of assets ownership minus the summed value of all debts, assumes mostly negative values for young adults. On the other hand, as income rises, asset accumulation starts and debt declines. For most people this occurs later in life, until retirement. Nam and Huang (2009) found that parental income is positively related to college attendance. I consider the logarithm of young adults' income (*lear*). This is statistically significant in 2009 and the forward years but assumes a negative value (except for 2005). This can be predicted because due to the high costs of college degrees, many young adults need to request help

from parents to pay tuition fees. The results (*Tables BI* to *BV*) indicate that those young adults who have some type of financial support from their parents or relatives (*psup*) are more likely to be enrolled in college. Our results also show that being employed (*emp*) reduces the probability of being enrolled in college (*enroll*). Young adults who are married or are cohabiting (*marr*) are less likely to be on course.

From 2009 onwards, a new explanatory variable is included in this model which states if young adults changed their educational plans due to G.R. or not (*ceduc*). Concerning this, for both 2009 and 2011, this variable is negative and statistically significant (*Tables BIII* to *BV*). We also use it (*ceduc*) as a dependent variable for the TA waves between 2009 and 2013. The results from the model converge to those obtained from the descriptive analysis. *Figure 3* illustrates the percentage of young adults who report changing educational plans due to the G.R. (*ceduc*=1), by types of change.

The empirical results, present in *Tables BI* to *BV* of the appendix, using probit regressions for each year of the analysis, show as predictors of educational plans change: the total assets value (*tassv*), students loans (*sloans*) and credit card debts (*ccard*), the support received from parents for tuition (*suptui*), and the closeness to father (*cfath*). These variables were included for several reasons.

First, *total asset value* (*tassv*) is included as a predictor because according to Rank and Hirschl (2010), young adults with greater accumulated assets are more able to face personal financial crisis. Our results point to a negative relation between total asset ownership and change in educational plans, for the years 2011 and 2013.

Second, because young adults are involved in accumulating debt to invest in human capital, smooth consumption over time or purchase a home early in life (Guiso & Sodini, 2013), student loans (*sloans*) and credit cards (*ccard*) are considered. Given the rising

costs of higher education, there has been an increasing reliance on student loans (Elliott & Nam, 2013). Young adults who have credit cards (*ccard*) are less likely to change their educational plans due to the G.R., possibly because they can make a more personal arrangement of their financial resources. This relation is statistically significant in two years: 2011 and 2013. Concerning student loans (*sloans*), it is only significant in 2009 and 2013, but signs of the effects vary. In 2009, due to the severe economic conditions, young adults were probably less likely to have student loans. Therefore, for those who did, the probability of changing educational plans due to the G.R. was diminished. With better financial conditions, in 2013, young adults might have had more access to student loans, using them to change to better situations.

Third, the support received from parents to pay tuition fees (*suptui*) is included because college enrollment increased with the G.R (U.S. Census Bureau, 2012). Moreover, tuition costs are high, which is a recognized barrier to college access and completion (Elliott & Beverly, 2011), and it is a negative predictor of change in educational plans, as expected.

Fourth, the closeness to father (*cfath*) is incorporated because when it comes to covering essential expenses that young people cannot meet, families might be the financial support that they desired (Friedline & Song, 2013). Indeed, the results indicate that as closeness to a young adult's father or another relative increases (*cfath*), the probability of changing education plans decreases. Notwithstanding, this is only true for 2011 as it is the only year in which the relation has statistical significance.

3.2.Panel Probit Regressions Results

Due to the characteristics of the database, and the possibility of building a balanced panel data, we adopt nonlinear panel models for scalar dependent variables (*stocks*, *bond*,

sav, veh, enroll and *ceduc*). For all the models estimated, we consider the best one to be the random effects model (RE) (please see *appendix F* for details).

The panel analysis is carried out considering all the individuals that were interviewed from 2007 until 2011 (N=2778). In *Table AIII* in the appendix the main characteristics of the sample are shown. The most frequently owned assets are the non-risky ones ($stocks_{it}$ and $bond_{it}$), which may indicate a more risk averse behavior. The distribution of ownership of non-financial assets (veh_{it} and sav_{it}) is asymmetrical, with a standard deviation barely the triple of the mean value. All net wealth measures ($netw_{it}$, $nwbond_{it}$, $nwstock_{it}$ $nwsav_{it}$ and $nwveh_{it}$) have negative means. This result confirms that the financial situation of those in transition to adulthood is fragile and that young adults do not tend to accumulate assets. Credit card ownership ($ccard_{it}$) and student loans ($sloans_{it}$) seem to be similar; their means are not so far away from the median, and near to the standard deviation. We define the same process as in the probit regressions studied before: four models for assets ownership ($bond_{it}$, *savit* $stocks_i$ *and* veh_{it}), one model for college enrollment ($enroll_{it}$) and one last model for the change in educational plans due to G.R. ($ceduc_{it}$).

As for probit models, in panel probit models, being white ($white_{it}$,) is positively associated with holding financial and non-financial assets. In the same way, the combined education appears as a significant and positive predictor of stock, and savings ownership, which is are line with the literature (Firedline & Elliot, 2011; Friedline, Elliott and Chowa, 2013).

Risky Asset Ownership (stocks and bonds)

The results are reported in *Table IV*. For each increase in net worth (excluding stocks) ($nwstock_{it}$), stock ownership is more likely to happen. Similarly, for each increasing year in net worth (excluding bonds) ($nwbond_{it}$) the probability of holding bonds increases.

Age, (age_{it}), has a negative sign, indicating that for each increasing year, the probability of holding bonds reduces.

G.R. (rec_{it}) is a strong negative predictor. In other words the G.R. reduced by 30.2% the probability that young adults hold stocks. On the other hand, for bond ownership, the post-recession period ($prec_{it}$) was found to have the greatest impact. It is statistically significant at 10% and has a negative sign. This result may be due to the fact that sometimes the effects of a crisis are not felt during the crisis itself but later.

TABLE IV
REGRESSION ANALYSIS OF RISKY ASSETS OWNERSHIP (2007-2011)

	Bonds ($bond_{it}$)			Stocks ($stocks_{it}$)		
	Pooled	RE	PA	Pooled	RE	PA
$white_{it}$	0.603***	0.827***	0.593***	0.631***	1.133***	0.628***
	(0.127)	(0.182)	(0.126)	(0.153)	(0.319)	(0.146)
$male_{it}$	0.0723	0.103	0.0588	0.112	0.241	0.135
	(0.103)	(0.142)	(0.104)	(0.123)	(0.229)	(0.122)
age_{it}	-0.553**	-0.691*	-0.483*			
	(0.265)	(0.382)	(0.258)			
age^2_{it}	0.0118**	0.0144*	0.0101*			
	(0.00599)	(0.00868)	(0.00585)			
$enroll_{it}$	0.176*	0.100	0.0942	0.0634	0.0744	0.0601
	(0.103)	(0.143)	(0.100)	(0.109)	(0.188)	(0.0915)
emp_{it}	0.249***	0.251*	0.187**	0.0436	-0.0187	0.0191
	(0.0967)	(0.139)	(0.0915)	(0.111)	(0.191)	(0.0885)
$nwbond_{it}$	4.53e-06**	4.57e-06**	3.89e-06*			
	(1.98e-06)	(2.19e-06)	(2.04e-06)			
$nwstock_{it}$				5.73e-06***	7.38e-06**	4.51e-06***
				(2.05e-06)	(3.18e-06)	(1.72e-06)
$mfeduc_{it}$	0.00249***	0.00369***	0.00263***	0.00855***	0.0137***	0.00802***
	(0.000915)	(0.00134)	(0.000885)	(0.00115)	(0.00227)	(0.00107)
$psup_{it}$	-0.0119	-0.00698	-0.00872	-0.0403	-0.0913	-0.0474
	(0.0416)	(0.0521)	(0.0419)	(0.0429)	(0.0687)	(0.0364)
rec_{it}				-0.159**	-0.302**	-0.158**
				(0.0725)	(0.146)	(0.0717)
$precy_{it}$	-0.197*	-0.267*	-0.193*			
	(0.103)	(0.146)	(0.101)			
Constant	3.956	4.870	3.331	-3.620***	-6.223***	-3.496***
	(2.893)	(4.165)	(2.810)	(0.270)	(0.683)	(0.246)
$\ln(\sigma_v^2)$		-0.0611			0.969***	
		(0.266)			(0.248)	
σ_v^2		.9699153			1.623296	
		(.1287683)			(.2010107)	
ρ		.4847315			.7249036	
		(.0663193)			(.0493875)	
LR $\bar{\chi}^2(01)$		48.68			130.24	
Prob > $\bar{\chi}^2(01)$		0.000			0.000	
Wald $\chi^2(8)$				90.38	56.48	93.33
Wald $\chi^2(10)$	72.34	57.67	66.69			
Prob > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Int. points		12			12	
Observations	1,916	1,916	1,916	1,914	1,914	1,914
Groups		679	679		680	680
Pseudo-R^2	0.0895			0.1708		

Robust standard errors in parentheses. ***|**|* = Significant at 1%| 5%| 10% levels.
See *Table I and II* for variables definition.

Non-risky Asset Ownership (savings and vehicles)

Table V shows the result that young adults who are enrolled (*enroll*) are more likely to have savings accounts. This is in accordance with previous research (Friedline & Elliott, 2013; Friedline & Song, 2013). A positive impact was also found for having student loans ($sloans_{it}$) and credit cards ($ccard_{it}$). The positive sign of $sloans_{it}$ and $ccard_{it}$ may be due to the fact such debts make it possible to smooth consumption, leaving a greater amount to have in savings. Credit card ownership also appears as a positive and significant predictor of vehicle ownership, as well as being male. On the other hand, the support received from parents ($psup_{it}$) decreases the probability of young adults having vehicles in their own name. Being married (*marr*) and employed (*emp*) both increased the probability of having savings as well as vehicles. Nowadays, being married tends to occur later in young adults' life. Moreover, it is expected that during family formation, savings are used to purchase durable goods and after that, they would flow into other kind of assets (Modigliani& Brumberg, 1954), such as savings accounts.

Unlike being married and employed, the Great Recession (rec_{it}) shows no significant impact on savings ownership. However, it does impact negatively on vehicle ownership while the post-recession period, on the other hand, impacts positively. The latter finding corresponds to an increase in the number of young adults who have vehicles in their own name.

Change in educational plans

Our results (*Table VI*) point to a negative and statistically significant relation between total asset ownership (*tassv*) and change in educational plans (*ceduc*). This may be because having great accumulated assets is associated with being more able to face a personal financial crisis (Rank & Hirschl, 2010). Changes in educational plans could be

a good decision. Young adults can understand that there are other options that may help them to have better life conditions in the future. Therefore, the positive sign of the logarithm of young adults' earnings ($lear_{it}$) and support from their parents or relatives ($suptui_{it}$) may be because young adults have better financial conditions that allow them to change. Young adults who are enrolled in college ($enroll_{it}$), are less likely to change their educational plans. This is in line with the descriptive statistics presented in *Figure EI* given that a minority report drop out of school as a consequence of G.R..

TABLE V
REGRESSION ANALYSIS OF NON-RISKY ASSETS (2007-2011)

	Savings (sav_{it})			Vehicles (veh_{it})		
	Pooled	RE	PA	Pooled	RE	PA
white	0.538***	0.653***	0.501***	0.271***	0.389***	0.266***
	(0.103)	(0.130)	(0.101)	(0.0851)	(0.120)	(0.0812)
male				0.175**	0.232**	0.157**
				(0.0798)	(0.117)	(0.0769)
enroll	0.800***	0.876***	0.698***	-0.0242	-0.0984	-0.0678
	(0.118)	(0.144)	(0.113)	(0.0752)	(0.102)	(0.0670)
emp	0.621***	0.691***	0.551***	0.507***	0.596***	0.389***
	(0.0981)	(0.118)	(0.0934)	(0.0701)	(0.0955)	(0.0634)
marr	0.156	0.224*	0.175*	0.386***	0.442***	0.296***
	(0.0994)	(0.131)	(0.0963)	(0.0805)	(0.106)	(0.0717)
ccard	1.088***	1.230***	0.962***	0.263***	0.355***	0.230***
	(0.118)	(0.148)	(0.112)	(0.0701)	(0.0943)	(0.0631)
sloans	0.415***	0.487***	0.406***			
	(0.120)	(0.150)	(0.112)			
nwveh				9.38e-07	1.83e-06	9.64e-07
				(1.42e-06)	(1.78e-06)	(1.23e-06)
nwsav	2.11e-06	2.40e-06	1.73e-06			
	(1.86e-06)	(3.09e-06)	(1.52e-06)			
mfeduc	0.00563***	0.00771***	0.00573***	0.000394	0.000280	0.000149
	(0.000884)	(0.00130)	(0.000823)	(0.000665)	(0.00100)	(0.000638)
psup				-0.172***	-0.220***	-0.146***
				(0.0288)	(0.0396)	(0.0260)
rec	0.105	0.134	0.103	-0.188***	-0.291***	-0.195***
	(0.0773)	(0.107)	(0.0750)	(0.0553)	(0.0878)	(0.0526)
precy				0.257***	0.441***	0.293***
				(0.0718)	(0.102)	(0.0669)
Constant	-1.263***	-1.494***	-1.162***	-0.815***	-1.042***	-0.681***
	(0.169)	(0.238)	(0.162)	(0.147)	(0.211)	(0.141)
$\ln(\sigma_v^2)$		-0.352			0.198	
		(0.255)			(0.152)	
σ_v^2		.8387317			1.103936	
		(.1069046)			(.0836275)	
ρ		.4129633			.5492806	
		(.0617988)			(.037509)	
LR $\overline{X}^2(01)$		43.40			183.48	
Prob > $\overline{X}^2(01)$		0.000			0.000	
Wald $X^2(11)$	301.47	193.64	287.43	213.96	186.13	190.16
Prob > X^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Int. points		12			12	
Observations	1,918	1,918	1,918	1,917	1,917	1,917
Groups		680	680		680	680
Pseudo-R^2	0.2999					

*Robust standard errors in parentheses. ***|**|* = Significant at 1%| 5%| 10% levels.*
See *Table I and II* for variables definition.

College enrollment

The results for college enrolment are in *Table VI*. They show that being female (*male*=0) is related with a high probability of being enrolled. This result was also achieved by Elliott and Beverly (2011) and Conley (2001) when testing the predictors of college graduation. Net Worth ($netw_{it}$) is negatively related to college enrollment, which is contrary to the results reported in the literature (Conley , 2001; Destin, 2009; Williams-Shanks & Destin, 2009; Haveman & Wilson, 2007; Nam & Huang, 2009; Elliott, 2008; and Morgan & Kim, 2006), all of whom considered family Net Worth instead of young adults' Net Worth. The reason for that is presented above, in college enrollment results for each year. Our results indicate that young adults who have any type of financial support from their parents ($psup_{it}$) or relatives are more likely to be enrolled in college. Nam and Huang (2009) found that parental income is positively related to college attendance. We do not consider the logarithm of young adults' income, as we did in probit regressions because it significantly reduces the observed values. Mothers and fathers' education ($mfeduc_{it}$) is also a good predictor of college enrollment. As it is positive, it means that high parental education increases the probability of being enrolled. Elliott and Beverly (2011) also found that household head's education is associated with college progress. For each increasing year of age (*age*), young adults are less likely to be on course. The G.R. has a positive relation with college enrollment. This result was also achieved by Wartenberg (2013). This result is associated with the results presented in next topic: changes in educational plans caused by Great Recession.

TABLE VI
REGRESSION ANALYSIS OF COLLEGE ENROLLMENT (2007-2011) AND CHANGE IN EDUCATIONAL PLANS (2009-2011)

	Enrollment			Change Educational Plans		
	Pooled	RE	PA	Pooled	RE	PA
male	-0.171**	-0.269**	-0.185**	.120	.139	.117
	(0.0814)	(0.110)	(0.0797)	(.103)	(.127)	(.102)
age	-0.773***	-1.144***	-0.855***			
	(0.253)	(0.329)	(0.238)			
age^2	0.0144**	0.0218***	0.0164***			
	(0.00583)	(0.00754)	(0.00549)			
enroll				-.245**	-.278**	-.227*
				(.121)	(.143)	(.117)
emp	-0.552***	-0.836***	-0.623***			
	(0.0742)	(0.0985)	(0.0684)			
lear				.095**	.108**	.086*
				(.045)	(.054)	(.045)
marr	-0.483***	-0.686***	-0.484***			
	(0.0876)	(0.113)	(0.0830)			
netw	-5.91e-6***	-6.09e-6***	-4.59e-6***	3.59e-06	4.43e-06	3.79e-06
	(1.57e-06)	(1.79e-06)	(1.39e-06)	(3.05e-06)	(3.40e-06)	(3.28e-06)
tassv				-7.23e-06*	-8.08e-06*	-6.78e-06
				(4.37e-06)	(4.47e-06)	(4.55e-06)
mfeduc	0.00384***	0.00536***	0.00389***			
	(0.000742)	(0.000946)	(0.000731)			
psup	0.158***	0.172***	0.126***			
	(0.0285)	(0.0385)	(0.0266)			
suptui				.263*	.318*	.258*
				(.139)	(.173)	(.136)
rec	0.199**	0.280***	0.208***			
	(0.0796)	(0.105)	(0.0777)			
precy	-0.220**	-0.306**	-0.229**			
	(0.105)	(0.135)	(0.0999)			
Constant	9.368***	13.75***	10.25***	-1.644***	-1.945***	-1.574***
	(2.739)	(3.563)	(2.582)	(.426)	(.534)	(.422)
$\ln(\sigma_v^2)$		-0.146			-0.682	
		(0.182)			(0.493)	
σ_v^2		.9293896			.7110686	
		(.0845168)			(0.1751755)	
ρ		.4634517			.3358211	
		(.045226)			(.1098968)	
LR $\overline{X}^2(01)$		98.35			8.32	
Prob > $\overline{X}^2(01)$		0.000			0.002	
Wald $X^2(6)$				13.03	13.51	11.66
Wald $X^2(10)$	345.95	283.84	349.97			
Prob > X^2	0.0000	0.0000	0.0000	0.0425	0.0357	0.0699
Int. points		12			12	
Observations	1,924	1,924	1,924	861	861	861
Groups		681	681		588	588
Pseudo-R^2	0.2141			0.0199		

Robust standard errors in parentheses. ***|**|* = Significant at 1%| 5%| 10% levels. See *Table I and II* for variables definition.

Conclusions, Limitations and Future Research

The G.R. has highlighted the importance of the research on young adults who are transitioning to adulthood, as they are the ones that were the hardest hit (Friedline & Song, 2013). Much of the literature about young adults focuses exclusively on one year of study and emphasizes either asset ownership or college. This research is focused on young adults, and it analyzes the determinants of both ownership of financial and real assets, and college enrollment. The G.R. shock and the period after are key issues in our research, which covers the period 2005 to 2013 for the US. Moreover, we also analyze the impact that the G.R. had on the educational plans of American young adults, drawing on answers to questions recently introduced in the TA- PSID survey and which had never been studied, as far as we know.

Probit models by year were estimated using different samples created from TA- PSID data for 2005, 2007, 2009, 2011, and 2013. Moreover, to understand the behavior of the same individual across time, we constructed a balanced panel database (N=2778) and applied panel Probit regressions. The panel regression results help to clarify the results achieved with probit regressions because frequently the results change across years. The dependent and binary variables are the same for probit and panel-probit models: bonds' (*bond*), stock (*stocks*), savings (*sav*) and vehicle (*veh*) ownership, college enrollment (*enroll*) and change in educational plans (*ceduc*).

The main conclusion of this research is that the G.R. negatively impacted the ownership of stocks (*stocks*) and vehicles (*veh*). On the other hand, it led to an increase in college enrollment (*enroll*). The latter result is line with the argument that high school education is no longer seen as sufficient (Kendig, Mattingly, & Bianchi, 2014; Oppenheimer, Kalmijn, & Lim, 1997; Oppenheimer, 2003) in this highly competitive economy in which the demand for post-secondary education is high (Elliott & Beverly,

2011). In the period after the G.R., the likelihood of holding bonds (*bond)* decreased, while the opposite was found for vehicles (veh). No significant relation with either the Great Recession (*rec*) or post-recession period (*prec*) was found for savings accounts (*sav*), The reason for this result may be related to the fact that because it is a safe asset, people do not withdraw their savings in turbulent times.

Other outcomes emerge from this research. They add value because they consider different assets with different risk levels, as well as human capital. They are briefly listed:

Financial and real assets:

- Being white impacts positively on stock (*stocks*), bond (*bond*), savings (*sav*) and vehicle (*veh*) ownership. Similarly, the parents' educational level affects stock (*stocks*), bond (*bond*), and savings (*sav*) ownership positively.
- Young adults who are employed (*emp*) are more likely to hold bonds (*bond*), savings (*sav*), and vehicles (*veh*);
- Being enrolled is associated with a high probability of having savings accounts (*sav*), as found in previous research (Friedline & Elliott, 2013; Friedline & Song, 2013).
- Young adults who are male (*male*), married (*marr*), and have credit cards (*ccard*) are more likely to have vehicles in their own name.

Education Choices and Changes with the Great Recession

- Regarding college enrollment, the mothers and fathers' education (*mfeduc*) appears to be one of the most consistent and positive predictors of college enrollment, as Elliott and Beverly (2011) found in their study;
- Converging with Conley (2001), we also came up with a positive relation between being a female and college enrollment. Additionally, we found that parental support (*psup*) is a significant predictor of college enrollment. On the other hand, being employed (*emp*),

married (*marr*), and net wealth (*netw*) implies a low probability of being on a course. Young adults who report changing their educational plans due to the G.R. (*ceduc*) are also less likely to be enrolled.

- Total asset ownership (*tassv*) and parental support for tuition (*suptui*) are the best predictors of change in educational plans.

Future Research Avenues

In this dissertation we only consider the data available that is provided in the TA studies. We do not include information concerning pre adulthood period (available in CDS Supplement), and family information (PSID). This is a limitation because most of literature reviewed uses these variables as explanatory. As a result, we did not have as much literature as we would like, probably because our topic of investigation is, to our knowledge, still emerging.

One of the limitations of this research is the data available for 2013. Because it is a preliminary version, the codebook is not yet available. Therefore, some variables could not be recoded because we were unable to decipher them, even using the codebook of 2011 as a way of comparison. Moreover, the sample weights to use in the descriptive statistics are not available.

The main identified avenues for future research are: compare the impact of the G.R. on young adults who had savings accounts as children and those that did not; study the impact of the Great Recession on young adults in Europe; and analyze in greater detail the reasons underlying the change in educational plans.

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Appendices

APPENDIX A

TABLE AI
RELATIONSHIP BETWEEN DEPENDENT VARIABLES CREATED AND QUESTIONS FROM TA QUESTIONNAIRE

Variable	TA Questionnaire Question	Answer
Bonds $(bond_t)$; $(bond_{it})$	*"Do you yourself have any other savings or assets, such as money market funds, certificates of deposit, government savings bonds, or rights in a trust or estate that you haven't already told us about?"*[a]	Yes or no
Change in Educational Plans $(ceduc_t)$; $(ceduc_{it})$	*"Has the current economic recession led you to change your educational plans?"*[b]	Yes or no
Enrolment Status $(enroll_t)$; $(enroll_{it})$	*"Are you currently attending college?"*[a]	Yes or no
Savings (sav_t); (sav_{it})	*"Do you yourself have a checking or savings account?"*[a]	Yes or no
Stocks $(stocks_t)$; $(stocks_{it})$	*"Do you yourself have any shares of stock in publicly held corporations, mutual funds, or investment trusts, NOT including stocks in employer-based pensions or IRAs?"*[a]	Yes or no
Vehicles (veh_t); (veh_{it})	*"Do you own a personal vehicle, such as a car, truck, or motocycle? We are interested only in vehicles for which your name is on the title."*[a]	Yes or no

[a] These questions were taken from the TA questionnaires available for 2005, 2007, 2009, 2011 and 2013. The codification was done considering the codebooks available for all these years, except for 2013, in which 2011 codebook was considered (codebook for 2013 is not available yet).
[b] This question only exists from 2009 onwards. The codification was done considering the codebooks available for 2009 and 2011.

Source: Author's elaboration based on TA supplement for 2005-2013 and codebooks available for 2005-2011.

TABLE AII
DESCRIPTIVE STATISTICS FOR 2005 AND 2007

	2005					2007				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables										
$bond_t$	742	.0930	.2906	0	1	1113	.0881	.2835	0	1
$enroll_t$	745	.5329	.4993	0	1	1115	.4466	.4974	0	1
sav_t	745	.7530	.4315	0	1	1113	.06378	.2445	0	1
$stocks_t$	743	.0565	.2311	0	1	1114	.3761	.4847	0	1
veh_t	744	.3118	.4636	0	1	2155	17.7541	3.7777	0	23
Independent Variables										
age_t	2155	15.9086	3.2548	0	21	2155	329.4701	109.84	0	529
age_t^2	2155	263.6719	92.6440	0	441	1115	.3695	.4829	0	1
$ccard_t$	745	.3195	.4666	0	1	2684	.2355	.4244	0	1
emp_t	2684	.1371	.3440	0	1	829	8.8331	1.1081	4.6052	11.3203
$lear_t$	506	8.2454	1.2432	2.9957	1.1552	2683	.07678	.2663	0	1
$marr_t$	2683	.0347	.1830	0	1	2155	.4942	.5001	0	1
$male_t$	2155	.4942	.5001	0	1	761	176.4625	58.172	0	289
$mfeduc_t$	549	177.7687	58.1260	0	289	1094	1208.926	17761.01	-149400	181000
$netw_t$	736	3116.586	34925.77	-199500	806000	1115	1.2781	1.2711	0	5
$psup_t$	745	1.345	1.2617	0	5	1114	.7747	.4180	0	1
$sloans_t$	743	.2046	.4037	0	1	1114	.2801	.4492	0	1
$suptui_t$	745	.3114	.4634	0	1	1115	.27354	.4460	0	1
$tassv_t$	745	5415.654	33169.22	0	806000	1115	5590.057	12630.94	0	181000
$white_t$	2654	.1424	.3496	0	1	2676	.2108	.4079	0	1

Source: Author's computation considering the Ta for years 2005 and 2007.

TABLE AIII
DESCRIPTIVE STATISTICS FOR 2009, 2011 AND 2013

	2009					2011					2013				
	Obs	Mean	S.D	Min	Max	Obs	Mean	S.D.	Min	Max	Obs	Mean	S.D.	Min	Max
Dependent Variables															
$bond_t$	1548	.0652	.2470	0	1	1904	.0557	.2293	0	1	1800	.0406	.1973	0	1
$ceduc_t$	1545	.2945	.4560	0	1	1897	.3026	.4595	0	1	1806	.1512	.3583	0	1
$enroll_t$	1554	.4060	.4913	0	1	1907	.3629	.4810	0	1	1807	.3509	.4774	0	1
sav_t	1552	.7564	.4294	0	1	1907	.7667	.4231	0	1	1806	.7896	.4077	0	1
$stocks_t$	1552	.0490	.2159	0	1	1904	.0520	.2221	0	1	1805	.0499	.2177	0	1
veh_t	1553	.3793	.4854	0	1	1906	.4119	.4923	0	1	1805	.3873	.4873	0	1
Independent Variables															
age_t	2155	19.736	3.7835	0	25	2155	2129.049	4.9330	0	27	2122	22.0594	2.8168	17	27
age_t^2	2155	403.8167	121.283	0	625	2155	477.6079	150.9088	0	729	2122	494.5467	124.471	289	729
$ccard_t$	1550	.3290	.4700	0	1	1907	.3456	.4757	0	1	1801	.3670	.4821	0	1
emp_t	2682	.3192	.4662	0	1	2683	.4242	.4943	0	1					
$lear_t$	1149	8.8232	1.3536	0	11.6953	1210	8.9163	1.3714	3.69	12.044					
$marr_t$	2684	.1289	.3352	0	1	2683	.1856	.3889	0	1	2684	.1777	.3823	0	1
$male_t$	2155	.4942	.5001	0	1	2155	.4942	.50010	0	1	2155	.4942	.5001	0	1
$mfeduc_t$	1102	181.6924	59.2233	0	289	1312	182.0785	59.5300	0	289					
$netw_t$	1553	-288.5776	25539.65	-159300	507000	1907	-945.9324	25646.54	-193200	405000					
$psup_t$	1551	1.0387	1.1886	0	5	1906	1.0714	1.2658	0	6	1803	1.1886	1.3948	0	7
$sloans_t$	1552	.7564	.4294	0	1	1907	.3865	.4871	0	1	1806	.3843	.4866	0	1
$suptui_t$	1551	.2289	.4203	0	1	1906	.1821	.3860	0	1	1803	.1825	.3863	0	1
$tassv_t$	1554	6171.255	20887.42	-10000	510000	1907	6989.206	18654.07	-20047	405000	1807	7314.726	18322.88	0	420000
$white_t$	2676	.2870	.4524	0	1	2676	.3554	.4787	0	1					

Source: Author's computation considering the Ta for years 2009, 2011 and 2013.

TABLE AIV
PANEL DESCRIPTIVE STATISTICS

	Obs	Mean	Std. Dev.	Min	Max
Full Sample N= 2778					
Dependent Variables					
$bond_{it}$	1850	.0632432	.2434658	0	1
$ceduc_{it}$ (a)	1224	.2075163	.4056942	0	1
$enroll_{it}$ (b)	1852	.2829374	.4505479	0	1
sav_{it}	1852	.787797	.4089783	0	1
$stocks_{it}$	1850	.0627027	.242493	0	1
veh_{it}	1851	.5002701	.500135	0	1
Independent Variables					
age_{it}	1852	23.01728	1.877595	19	27
age_{it}^2	1852	533.3186	86.41291	361	729
$ccard_{it}$	1852	.4163067	.4930788	0	1
emp_{it}	1851	.6601837	.4737747	0	1
$lear_{it}$	1318	9.281326	1.229131	0	12.04355
$marr_{it}$	1852	.3185745	.4660494	0	1
$male_{it}$	1852	.4492441	.4975515	0	1
$marr_{it}$	1852	.3185745	.4660494	0	1
$mfeduc_{it}$	1295	183.9205	60.32177	0	289
$netw_{it}$	1851	-874.7239	32520.99	-193200	507000
$nwbond_{it}$	1851	-1973.271	27008.12	-193200	293000
$nwstock_{it}$	1850	-2056.583	29184	-193200	507000
$nwsav_{it}$	1851	-3746.147	30408.21	-200000	505500
$nwveh_{it}$	1850	-4773.637	30342.42	-199200	498500
$prec_{it}$	1852	1	0	1	1
$psup_{it}$	1852	.8795896	1.155671	0	6
rec_{it}	1852	.5	.500135	0	1
$sloans_{it}$	1852	.4200864	.4937058	0	1
$suptui_{it}$	1852	.1587473	.365539	0	1
$tassv_{it}$	1852	9042.168	25175.89	-20047	510000
$white_{it}$	1840	.523913	.4995636	0	1

- This variable is not available for 2007. As a consequence, panel data only considering data for 2009 and 2011 were considered. However, the full sample is the same because I considered the individuals that also answered TA 2007.
- This variable is also used as an explanatory variable.

Source: Author's computation considering the Ta for years 2007, 2009 and 2011.

APPENDIX B

TABLE BI
PROBIT REGRESSION RESULTS FOR 2005

	Stocks		Bonds		Savings		Vehicles		College enrollment	
	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD
enroll	0.0022	0.239	-0.0007	0.189	0.204***	0.156	-0.094*	0.137		
male	0.0051	0.182	-0.0413*	0.158	-0.013	0.144	0.081*	0.120	-0.2079***	0.153
white	0.0602***	0.264	0.0801***	0.197	0.198***	0.146	0.17***	0.132		
emp	0.0023	0.198	0.0252	0.166	0.097***	0.149	0.16***	0.123	-0.1664***	0.151
mfeduc	0.0004**	0.00192	0.0006**	0.0017	0.001**	0.0015	-0.001*	0.00125	0.0022***	0.0015
psup	0.0120	0.0773	0.0184*	0.0659					0.1252***	0.0666
age	-0.5962**	2.617**	.8285*	2.838	0.7748*	2.617				
age^2	0.0162	0.0692**	-0.0224*	0.0754	-0.0205*	0.055				
ccard							0.086*	0.128		
marr							0.25***	0.181	-0.3967***	0.233
lear									0.0234	0.0619
netw									6.91e-07	5.84e-06
LR $X^2(7)$					105.71		73.92		125.60	
LR $X^2(8)$	41.15		35.04							
Prob > $X^2(7)$					0.0000		0.0000		0.0000	
Prob > $X^2(8)$	0.0000		0.0000							
Log Lik.	-118.3305		-167.000		-203.194		-302.91		-190.5819	
% corr. classified	.0458		.0877		.8648		.3341		.6214	
Pseudo-R^2	0.1481		0.0949		0.2064		0.1088		0.2479	
N	525		525		527		526		374	

Source: Author's computation considering the Ta for years 2007.***|**|* = Significant at 1%| 5%| 10% levels.

TABLE BII
PROBIT REGRESSION RESULTS FOR 2007

	Stocks		Bonds		Savings		Vehicles		College Enrolment	
	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD
enrol	0.0239	0.189	0.0245	0.153	0.1958***	0.146	-0.0473	0.108		
male	0.0073	0.150	0.0003	0.128	-0.0084	0.125	.0433	0.0989	-0.0215	0.120
white	0.0550***	0.217	0.0974***	0.165	0.1052***	0.125	0.1110***	0.106		
emp	0.0066	0.171	0.0551**	0.147	0.0832***	0.136	0.2399***	0.108	-0.2838***	0.126
mfeduc	0.0007***	0.0016	0.0005**	0.00131	0.0012***	0.00126	-0.0003	0.000923	0.001**	0.00110
psup	0.0016	0.0629	0.0048	0.0553					0.1063***	0.0516
age	-0.0958	1.124	0.0098	0.982	0.1384	0.917				
age^2	0.0026	0.0280	-0.0005	0.0246	-0.0031	0.0229				
Lear									-0.0230	0.0553
netw									-4.35e-07	2.94e-06
ccard							0.1187***	0.100		
marr							0.1568***	0.128	-0.2534***	0.159
LR $X^2(7)$					142.99		93.70		165.58	
LR $X^2(8)$	70.24		41.64							
Prob > $X^2(7)$	0.0000		0.0000		0.0000		0.0000		0.0000	
Log Lik.	-174.3705		-242.7802		-264.2562		-460.4538			
% corr. classified	.0448		.0906		.8946		.3867		.4888	
Pseudo-R^2	0.1677		0.0790		0.2129		0.0923		0.2100	
N	755		755		756		755		569	

Source: Author's computation considering the Ta for years 2007. ***|**|* = Significant at 1%| 5%| 10%

TABLE BIII
PROBIT REGRESSION RESULTS FOR 2009

	Stocks		Bonds		Savings		Vehicles		College Enrolment		Change Educ. Plans	
	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD
enrol	-0.0177	0.157	0.0304*	0.134	0.2009***	0.123	-0.0692**	0.0875				
male	0.0144	0.132	0.0019	0.117	-0.0393*	0.105	0.0980***	0.0817	-0.0481	0.0958	-0.0572**	0.0740
white	.050***	0.191	0.0758***	0.156	0.1189***	0.104	0.1281***	0.0892			-0.1405***	0.0760
emp	-0.011	0.143	0.0293*	0.127	0.1590***	0.109	0.2195***	0.0848	-0.1580***	0.103		
mfeduc	0.0006***	0.0014	0.0002	0.0012	0.0011***	0.001	-0.0004	0.0007	0.0013***	0.0009		
psup	0.0017	0.0565	0.0071	0.0507					0.0825***	0.0407		
Suptui											-0.1050***	0.0926
Cfath											-0.0052	0.0192
age	-0.0690	0.586	0.0264	0.541	0.0788	0.462						
age^2	0.0017	0.0140	-0.0006	0.0129	-0.0014	0.0111						
lear									-0.0461***	0.0388		
Tassv											-2.50e-07	2.61e-06
Netw									-2.18e-06**	2.37e-06		
ccard							0.0777**	0.0849			-0.01581	0.0813
Sloans											-0.0566**	0.0774
marr							0.1850***	0.0982	-0.2348***	0.125		
ceduc									-0.1861***	0.110		
LR $X^2(7)$					285.53		146.43				69.69	
LR $X^2(8)$	72.02		47.48						204.75			
Prob > $X^2(7)$					0.0000		0.0000				0.0417	
Prob > $X^2(8)$	0.0000		0.0000						0.0000			
Log Lik.	-218.8052		-282.32132		-387.0823		-660.80286		-475.07712			
% corr. classified	.0361		.0631		.8861		.3824		.4663		.2782	
Pseudo-R^2	0.1413		0.0776		0.2694		0.0997		0.1773		0.0417	
N	1,095		1,093		1,097		1,095		835		1,392	

Source: Author's computation considering the Ta for years 2009.
***|**|* = Significant at 1%| 5%| 10% levels.

TABLE BIV
PROBIT REGRESSION RESULTS FOR 2011

	Stocks		Bonds		Savings		Vehicles		College Enrolment		Change Educ. Plans	
	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD
enrol	0.0195	0.144	0.0138	0.143	0.1741***	0.122	-0.1034***	0.0809				
male	0.0130	0.117	0.0289***	0.118	-0.0044	0.0964	0.0705**	0.0745	-0.1167***	0.0981	-0.0297	0.0664
white	0.0529***	0.161	0.0602***	0.163	0.1224***	0.0962	0.1192***	0.0788			-0.1349	0.0681***
emp	0.0232**	0.140	0.0305**	0.141	0.1941***	0.101	0.2218***	0.0791	-0.2682***	0.108		
mfeduc	0.0006***	0.0012	0.0003***	0.00114	0.0010***	0.000892	-0.0001	0.0007	0.0011***	0.000845		
Psup	-0.0037	0.0513	-0.0057	0.0522					0.1027***	0.0409		
Suptui											-0.0927***	0.0883
Cfath											-0.0144*	0.0182
Age	0.0371	0.391	0.0187	0.386	0.0252	0.302						
age^2	-0.0007	0.0088	-0.0004	0.00873	-0.0003	0.00688						
lear									-0.0613***	0.0406		
Tassv											-1.83e-06*	2.91e-06
Netw									-1.18e-06*	1.80e-06		
Ccard							0.1605***	0.0776			-0.0496	0.0730**
Sloans											-0.0047	0.0686
marr							0.1851***	0.0851	-0.1673***	0.117		
ceduc									-.079368*	0.110		
LR $X^2(7)$					292.02		207.84		272.05		85.60	
LR $X^2(8)$	96.67		59.24									
Prob > $X^2(7)$					0.0000		0.0000		0.0000		0.0000	
Prob > $X^2(8)$	0.0000		0.0000									
Log Lik.	-281.61216		-273.82502		-444.56623		-795.90885		-455.79126		-975.3452	
% corr. classified	0.0412		0.0434		0.8951		0.4526		0.4104		0.2831	
Pseudo-R^2	0.1465		0.0976		0.2472		0.1155		0.2298		0.0420	
N	1,303		1,303		1,306		1,305		869		1,684	

Source: Author's computation considering the data of TA for 2011. In this case, in the model for college enrollment, we add the variable *ceduc* for 2011.
***|**|* = Significant at 1%| 5%| 10% levels.

TABLE BV
PROBIT REGRESSION RESULTS FOR 2013

	Stocks		Bonds		Savings		Vehicles		College Enrolment		Change Educ. Plans	
	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD	dy/dx	SD
enrol	0.0294**	0.131	-0.0041	0.1497	0.1546***	0.1007	-0.1015***	0.0786				
male	0.0437***	0.114	0.0174*	0.1207	-0.0036	0.0782	0.0689***	0.0702	-0.0660***	0.0752	-0.0261	0.8858
mfeduc												
Psup	0.0088*	0.0446	0.0036	0.1207					0.0995***	0.0279		
Suptui											-0.0502*	0.1294
Cfath											-0.0008	0.0249
Age	0.0625	0.5964	0.0850	0.6444	-0.1475	0.4073						
age²	-0.0011	0.0127	-0.0018	0.0139	0.0034	0.0088						
Tassv											-1.53e-06*	4.00e-06
Ccard							0.2290***	0.0714			-0.0403*	0.0953
Sloans											0.0869***	0.0884
Marr							0.1867***	0.0761	-0.1012***	0.0858		
Ceduc									-0.0524	0.1058		
LR $X^2(6)$											33.24	
LR $X^2(5)$	26,72		6.13									
LR $X^2(4)$					49.64		128.18		163.16			
Prob > $X^2(6)$											0.0000	
Prob > $X^2(5)$	0.0001		0.2938									
Prob > $X^2(4)$					0.0000		0.0000		0.0000			
Log Lik.	-295,1226		-243.8741		-674.6508		-887.0802		-750.1232		-524.6008	
% corr. classified	0.0510		.04166		0.8076		0.4433		0.2703		0.1475	
Pseudo-R^2	0,0433		0.0124		0.0355		0.0674		0.0981		0.0307	
N	1384		1,383		1,389		1,384		1388		1,250	

Source: Author's computation considering the data of TA for 2011. In this case, in the model for college enrollment, we add the variable ceduc for 2013.
***|**|* = Significant at 1%| 5%| 10% levels.

APPENDIX C

TABLE CI
QUALITATIVE RESULTS FOR NON-PANEL PROBIT REGRESSIONS

	Bonds					Stocks					Savings					Vehicles				
	2005	2007	2009	2011	2013	2005	2007	2009	2011	2013	2005	2007	2009	2011	2013	2005	2007	2009	2011	2013
white	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	
male	-			+	+					+			-			+		+	+	+
age	+					-					+									
age²	-										-									
enroll			+								+	+	+	+	+	-		-	-	-
emp		+	+	+					+		+	+	+	+		+	+	+	+	
marr																+	+	+	+	+
ccard																+	+	+	+	+
mfeduc	+	+		+		+	+	+	+		+	+	+	+		-				
psup	+									+										

Source: Author's computation.

TABLE CII
QUALITATIVE RESULTS FOR NON-PANEL PROBIT REGRESSIONS

	Enrolment			Change in Educational Plans		
	2009	2011	2013	2009	2011	2013
white				-		
male		-	-	-		
emp	-	-				
Lear	-	-				
marr	-	-	-			
Ccard						-
sloans				-		+
tassv					-	-
netw	-	-				
Cfath					-	
mfeduc	+	+				
psup	+	+	+			
suptui				-	-	-
ceduc	-	-				

Source: Author's computation.

TABLE CIII
QUALITATIVE RESULTS FOR PANEL PROBIT REGRESSIONS

	Bonds	Stocks	Savings	Vehicles	Enrollment	Change in Educational Plans
white	+	+	+	+		
male				+	-	
age	-				-	
age^2	+				+	
enroll			+			-
emp	+		+	+	-	
lear						+
marr			+	+	-	
ccard			+	+		
sloans			+			
tassv						-
netw					-	
nwbond	+					
nwstock		+				
nwsav						
nwveh						
mfeduc	+	+	+		+	
psup				-	+	
suptui						+
rec		-		-	+	
precy	-			+	-	

Source: Author's computation.

APPENDIX D – Descriptive Statistics of dependent variables in each year

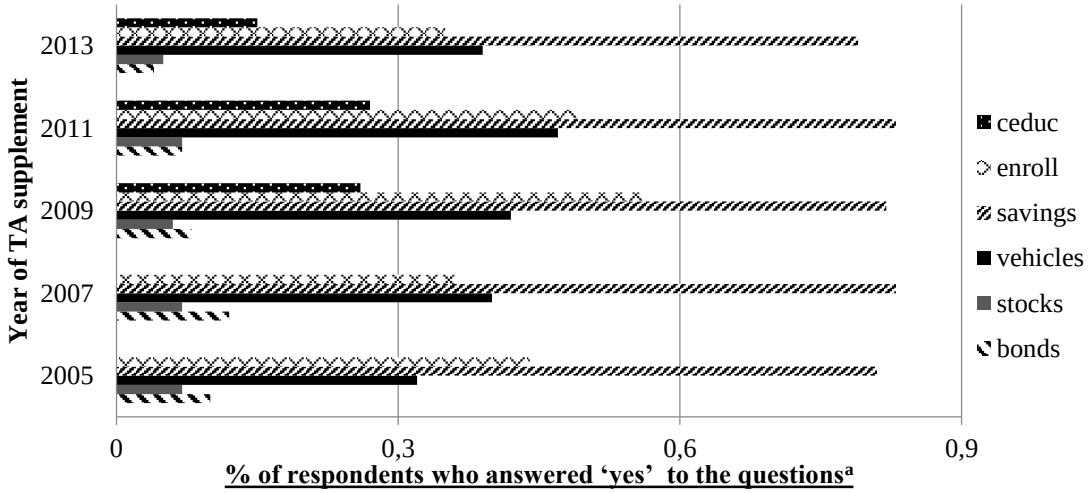

FIGURE DI - Descriptive information of dependent variables in each year

- TA questions and variables codes available in table AI in the appendix.

Source: Author's construction based on TA data available for 2005, 2007, 2009, 2011 and 2013. The data are weighted using the weights provided by the University of Michigan, except for 2013, because this information is not available yet.

Figure DI reports descriptive information for the dependent variables. Analyzing all the years, we can conclude that the year in which the change in educational plans was most intense was 2011, which corresponds to the period immediately after GR. College enrollment peaked in 2009, suggesting that with the GR, the number of young adults who decided to do a course,

increased. Regarding the ownership of stocks and savings accounts, the behavior is relatively constant. Nevertheless, stock ownership declines in 2009 and 2013. The ownership of vehicles and bonds shows opposite behaviors: while the number of young adults who own a personal vehicle increased until 2011, the number of young adults who hold bonds decreased from 2007 onwards, suggesting that the GR has both immediate and rippled effects.

APPENDIX E – How change in Educational Plans is made

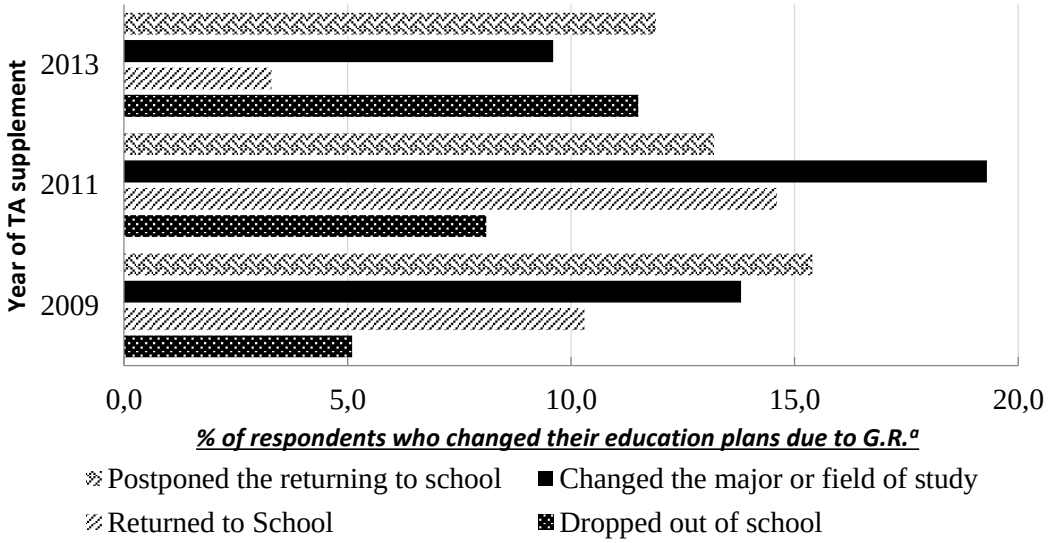

FIGURE EI - How Great Recession led Young Adults to change their Educational Plans?

- The graph shows the answers to question *"How has the current economic recession led you to change your educational plans?".* There was also another potential answer, *other reason,* which was not considered here as it could not be identified.

Source: Author's elaboration based on TA data for 2009, 2011 and 2013.

Concerning *postponement of returned to school,* there is a high percentage of answers in all the years, with 2009 and 2013 displaying the highest frequency values. Notwithstanding, there is a decreasing trend. This might be due to the high demand for post-secondary education (Elliott & Beverly, 2011).

By contrast, the number of young adults who report having *dropped out of school* increases in the period 2009-2013. However, this reason was the least frequently chosen in 2009 and 2011. This can be contrasted with the increase in the percentage of young adults who *return to school* in the period of 2009-2011. In 2011, almost 20% of the TA's respondents report that the

G.R. led them to *change the major of study*. This might be due to US labor market changes, which have different impacts on different professional areas.

The change to educational plans associated with the G.R., as far as the author of the present research knows, is the first time that it is being analyzed. There is information for three years, 2009, 2011 and 2013. However, the 2013 data are not completely comparable with the other two years as it is a preliminary version (see section 2.1.1). Therefore, the comparison of model results for 2013 with those of the previous years is less detailed.

Appendix F - SELECTION OF PANEL DATA MODELING ALTERNATIVES

In order to model binary outcomes using panel data, there are three modelling alternatives: (a) linear probability model (LPM); (b) probit models; and (c) logistic models (Cameron & Trivedi, 2005). Even though it is the simplest to estimate, as Wooldridge (2010, p.457) states, LPM is not recommended because it does not consider the discreteness of the dependent variable and it allows probability values out of the [0, 1] interval. Two alternatives remain: probit and logit models. The main difference between probit and logit is that the first assumes that ε_{it} has a standard normal distribution, while the second assumes that it has a logistic distribution. Because the choice between these two models is quite indifferent we will use probit models, because the interpretation of marginal effects is more direct than in logit case.

The general approaches to nonlinear panel models are similar to those for linear models, such as pooled, population-averaged (PA), random effects (RE), and fixed effects (FE). To choose the model that best fits to our data and produces the most consistent and efficient results, some tests were performed. However, the choice of the 'correct model' is not as immediate as if we were working with linear models.

Generally, because it is a short panel (3 years), we expect at priori that there is no need to control for fixed effects (FE) (Cameron & Trivedi, 2009, p. 607). The FE allows regressors to

be endogenous provided that they are correlated only with a time-invariant component of error (α) (Cameron & Trivedi, 2009). Therefore, we assume that something within the individual characteristics may impact or bias the explanatory variables. However, given that we are using a probit model and the panel considered is short (3 years), a consistent estimation of fixed-effects models is not possible (Cameron & Trivedi, 2009). There does not exist a statistic allowing the fixed effects to be conditioned out of the likelihood and the unconditional fixed-effects estimates are biased (StataCorp., 2011). Besides being inconsistent when the length of the panel is fixed, the fixed-effects maximum likelihood estimator also appears to be biased in finite samples (Greene, 2002).

It is essential to test for random effects. The analysis of the likelihood ratio test of p=0 which is used to verify if it is necessary to allow for random intercept is mandatory.. This test compares the model with a random intercept with the naïve probit regression. The result of this test (available in *Tables IV,V* and *VI*) suggests that it is necessary to allow for a random intercept due to the high significance of the p-value (Twisk, 2003, p. 135). There are some random-effects estimators that use adaptive or non-adaptive Gauss–Hermite quadrature to compute the log likelihood and its derivatives (StataCorp., 2011). The adaptive quadrature, which is the default integration method, is considered to be much more accurate because it refits the model for different numbers of quadrature points and then compares the different solutions. A good random-effects model fit depends on the goodness of the quadrature approximation, as well as the goodness of the data (StataCorp., 2011). The coefficients do not change by more than 0.01%, so the results may be confidently interpreted[11] (StataCorp., 2011).

The pooled probit assumes independence over *i* and *t,* which may lead to efficiency loss (Cameron & Trivedi, 2009, p. 603). To correct standard errors for any dependence over time

[11] Due to space constraints, tables are not presented here, but can be found in the Supplementary Material available upon request.

for a given individual, it is possible to use a panel-robust or cluster robust estimate of the variance-covariance matrix of the estimator (VCE). Unlike the linear case, in nonlinear models the pooled estimation leads to inconsistent parameter estimates if the random effects model is the appropriate one, which is the case in our study (Cameron & Trivedi, 2009, p. 603). However, efficiency gains can be obtained by using the population-averaged model (PA). This model belongs to the generalized estimating equations (GEE), which assumes that the correlations are the same regardless of how many years apart the observations are (Cameron & Trivedi, 2009, p.610). This approach is similar to the pooled feasible generalized least squares (FGLS) for linear models (Cameron & Trivedi, 2009, p.603). For our data this model may not be adequate because the correlations in *veh, stocks, sav, bonds, enroll* and *ceduc* varied considerably with the lag length[12].

Nonetheless, one should also be concerned about heteroskedasticity and multicollinearity. Heteroskedasticity is present when the variance of the unobserved factors is not constant (Wooldridge, 2012). Because the dependent variable in probit models is a probability, it embodies uncertainty that comes from all variables that are included in the model. To deal with heteroskedasticity, it is necessary to define the dependent variable of interest as the probability given the control variables in our model. Therefore, the model results give an accurate description of what is found in the data (Williams, 2009), leaving no need to correct heteroskedasticity. Multicollinearity is the correlation among two or more independent variables, and it leads to inappropriate conclusions (Wooldridge, 2009). To see if there is a multicollinearity problem, one should look to the correlation matrix and check the significance levels. Details of the correlation matrix, including tables are available upon request.

To sum up, due to result likelihood ratio test of rho=0, we consider the best model to be the random effects (RE).

[12] Due to space constraints, tables are not presented here, but can be found in the Supplementary Material available upon request.