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**Minor Inconvenience: Evaluating the CARD
Act's Credit Protections on Young
Consumers**

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Abstract

The Credit Card Accountability Responsibility and Disclosure Act of 2009 established financial protections for credit consumers in the aftermath of the Great Recession. The Federal Government felt that credit institutions were taking advantage of consumers with marketing ploys and indirect disclosure relating to the true cost of debt. Particular attention was put on young adults and college students, imposing additional barriers to obtain a credit card. As a result, this may lead to latent credit market entry and increase consumption inequality by further limiting access to certain demographics more than others. This study aims to measure the extent at which the CARD Act limited credit access to young consumers, and if the behaviors of those consumers changed. The analysis uses individual data from the Panel Study of Income Dynamics, Transitioning Adults Supplement. A difference-in-difference methodology was implemented to estimate the impact on treated minors (under 21) when the act went into effect and a control group (over 21). The probability of owning a credit card and credit utilization were compared across the treatment and control groups. There was no (statistically significant) evidence to suggest restricted access implications, however negative trends for minors were found on all estimations. The overall objective of this study is to address the effectiveness of the CARD Act and facilitate discussion on disparities in the credit market.

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Contents

I Introduction	1
II Background	3
2.1 Review of Literature	3
2.2 Credit Card Accountability Responsibly and Disclosure Act of 2009	6
2.2.1 Title III - Protection of Young Consumers	6
III Data	8
3.1 Transition Into Adulthood Supplement	8
3.2 Descriptive Statistics	9
IV Methodology	14
4.1 Treatment Dummy Variable Regression	15
4.2 Partial Exposure Regression	15
4.3 Subgroup Analysis	16
4.4 Credit Utilization	17
V Results	18
5.1 Baseline Treatment Dummy Results: Owning a Credit Card	18
5.2 Baseline Partial Exposure Results	19
5.3 Credit Utilization Results	21
5.4 Subgroup Analysis Results	24
VI Discussion	24
6.1 Null Results & Statistical Significance	26
VII Conclusion	27

List of Tables

1	Survey Age by Year (Full Sample)	9
2	Baseline Treatment & Control Dependent Variables	10
3	Percentage Owning a Credit Card	10
4	Survey Age by Year (Estimation Sample)	11
5	Descriptive Statistics: Baseline (2009)	12
6	Estimation Sample: Before & After Act	13
7	Interaction Coefficient Comparison	18
8	Baseline Treatment Dummy Results - Probability of Owning a Credit Card	20
9	Baseline Partial Exposure Results	22
10	Credit Utilization: Extensive & Intensive Margin	23
11	Subgroup Analysis: Owning a Credit Card	25
12	Robustness Check: Excluding 2009	26

I. Introduction

Credit card use has grown in popularity over the years amongst young consumers. In 2009, approximately 84% of undergraduate college students had a credit card with half owning four or more (Sallie Mae Inc and Gallup, 2009). At a transitional stage in life, the demand for debt is increasing with age (Fulford and Schuh, 2015). Establishing credit is a critical financial stepping stone to larger consumption decisions, such as mortgage or auto loans. With low-incomes, credit cards are a flexible mean of unsecured credit to satisfy the high demand for consumption as well as maintain financial stability without the need for collateralize assets. However, there is a major concern that young adults cannot manage credit responsibly and are at lured into risky credit agreements by aggressive financial institutions. After the Great Recession, the Credit Card Accountability Responsibility and Disclosure Act of 2009 introduced financial protections for credit consumers, heightening entry barriers on the youth. This study aims to measure the extent to which the CARD Act limited credit access to these consumers, and if the behaviors of those consumers changed.

Prior to the CARD Act, anyone as young as 18 years old could apply for a credit card. With the new law, the legal age became 21 (minor) unless the applicant has a cosigner to assume joint liability or can indicate an individual mean of repayment. While these measures are meant to prohibit young consumers from entering into a financially irresponsible credit agreement, it may exclude those who could have otherwise had the means to obtain a credit card before the implementation of the CARD Act. To estimate the magnitude of the limitations, I implement a difference-in-difference methodology with fixed effects to determine whether the limited minors (treatment group) credit card uptake differs from non-minors (control group) using panel data from the Panel Study of Income Dynamics (PSID). I then compare the treatment effect between demographic subgroups. Historically, certain demographic groups have been under-served and further taken advantage of, regardless of the intent of financial institutions (Ruetschlin et al., 2013; Wheary and Draut, 2007). Subgroup analysis provides a further investigation as to whether the CARD Act perpetuated or reduced structural inequalities in the credit market.

My hypotheses are as follows: (1) heightened barriers of entry will restrict minors from entering the credit market, reducing the probability of having a credit card relative to if they were a non-minor or had the act not been implemented; (2) the hypothesized decrease in young credit market

participants will decrease credit utilization on the extensive margin; (3) credit behaviors will change on the intensive margin by reducing the value of carry-over balances. For credit utilization, I will be estimating both the extensive and intensive margins to capture shifts in the credit market as well as the panel sample. If the act had a significant effect, changes in both margins should be present.

A sizable portion of the literature comes in form of critique. Critics find the act unnecessary and restrictive to young adults in a time where they needed credit the most (Hinson, 2010; Willis, 2015). With the new limitations, Hinson (2010) believes the act would prove ineffective with deficiencies in implementing regulation ¹. The debate on whether youths are responsible enough to manage credit is speculated to be a misinterpretation of the financial outcomes from the Great Recession. Willis (2015) suggests similar notions as Hinson (2010), stating that the government misidentified youth debt as the problem rather than the consequences of poor credit execution such as having an excessive amount of credit cards or unreasonable credit limits. Furthermore, the act is purported to hamper youth entrepreneurship, constraining future young entrepreneurs from starting businesses that past generations had to opportunity to take (Schwartz, 2012). While there is no empirical evidence to my knowledge that supports this critique, it contributes to the importance of understanding the implications of the CARD Act and early credit behaviors.

There are few empirical studies that look at young adults specifically. The most closely related study is Debbaut et al. (2013) where a difference-in-difference analysis is used to compare minors and non-minors probability of having a credit card. They found that there was an 8% decrease in probability for the treatment group, and further extended the study to find a 3% higher likeliness of a minor having a cosigner for the card(s). While the study is similar to this paper, data is used from the New York Federal Reserve Bank Consumer Credit Panel partnered with Equifax. This is an extensive dataset with outcome variables such as delinquency and parental credit history but the sample set is exclusively individuals who already have (or have tried to obtain) a credit card ².

¹Hinson (2010) suggested that regulating the entry to the credit market will severely restrict individuals out of the market, and put no regulation on those who could still obtain a credit card with a cosigner or ability to pay. She proposed that limits be set on the number of credit cards or stronger restraints on university marketing

²Since Equifax is a credit reporting institution, those who are in dataset must have a previous credit history file. Debbaut et al. (2013) noted that in sample selection, individuals who had a credit card prior to the act were used in the estimations to mitigate selection bias.

Their analysis gives a sense of the change in *composition* of the credit market. My analysis differs by examining a sample of individuals who both have and have not obtained a credit card. Including individuals with no prior credit card allows us to observe behaviors/traits of a population omitted from credit history data and paint a picture of those missed by the market. Here, the analysis is on the change of *credit decisions* in a sample of young adults over time.

The results in this paper find no evidence that the CARD Act had limited credit access for young adults. There are indications that minors during the CARD Act had lower credit card uptake and utilization but the estimates are statistically insignificant. Almost all of the coefficients on difference-in-difference treatment interaction are negative, implying that minors were worse off than non-minors. When comparing across subgroups, the results were negative but insignificant so no conclusive inference can be made as well. However, the estimations provide insight on determinants of credit participation and initiate discussion on the importance of null significance.

This paper proceeds as follows. I review the relevant literature and provide further details surrounding credit behaviors and the CARD Act in Section II. Section III describes the data used in this analysis, followed by the empirical strategy in Section IV. I then report the results in Section V and provide discussion in Section VI, ending with closing remarks in Section VII.

II. Background

2.1. Review of Literature

Consumer spending habits have changed over the course of several years prior to and following the recession. In the years leading up to the Great Recession, consumer debt was increasing³, with household debts reaching over 1.2 times larger than personal income (Garriga et al., 2017). In the aftermath of the housing market crisis, debt declined drastically, primarily from delinquency in subprime mortgage. Total outstanding debt fell by an estimated \$1.3 trillion dollars⁴ (Brown et al., 2013) with credit card usage declining as well. Once the economy began to recover, credit cards came back with a strong rebound increasing the number of payments using a credit card by 7.6% from 2009 to 2012 (Federal Reserve Bank of St. Louis, 2014). These trends in credit have been attributed to a decrease in demand for consumer debt coupled with the tightening credit supply

³Consumer debts including mortgage, loans, credit cards, etc.

⁴In part due to a shift from borrowing to repayment and the subsequent delinquencies

by financial institutions and regulations.

Credit Behavior & Youth Consumer Spending. Young consumers, both students and non-students, are considered risky borrowers but there is no general consensus on their capacity for credit responsibility. [Agarwal et al. \(2015\)](#) found that young consumers tend to make more financial mistakes. Repayment rates have been found to be lower, all while taking on heavier debt loads relative to older generations ([Jiang and Dunn, 2013](#)). The cohort of young adults from the 2000s compared to the 70s and 80s have increased debt burdens while also entering the market at an earlier age ([Houle, 2014](#)). These studies show that young consumer trends are changing over time, but they do not give an indication of long-term credit outcomes. [Debbaut et al. \(2013\)](#) examines the relationship between age and credit, finding that younger borrowers are the least likely to default on credit card payments. Furthermore, the earlier an individual enters the credit market, regardless of age, the lower the risk of default.

Most literature surrounding minor credit behavior focus on financial literacy programs ([Adams and Moore, 2007](#); [Alexander and Mader, 2011](#); [Robb, 2011](#)). Young adults (including college students) tend to have low levels of literacy ([Mottola, 2014](#)). With the rise of student credit card debt over the years, this has sparked interest in finding solutions to the risky credit habits. Financial literacy, coupled with amendments in the CARD Act, have made improvements to credit behavior and indicate positive long-term financial decisions. The link between the two has been shown to be a significant factor in credit card decisions ([Robb, 2011](#)) and can mitigate risk behaviors associated with youth consumption ([Xiao et al., 2011](#)). When offering college students a free line of credit, [Berrocal et al. \(2012\)](#) found that controls on credit lines are beneficial to the young consumers.

Some studies even link credit behaviors in college students to physical and mental health outcomes, highlighting an additional dimension of importance on the subject. High-risk use of credit is shown to be associated with other high-risk behaviors ([Adams and Moore, 2007](#); [Nelson et al., 2008](#)). Students who had higher amounts of debt (amongst those with and without a credit card) were more likely to partake in drugs or drunk driving and perform poorly in obesity, depression and academic metrics. Understanding potential implications of credit behaviors beyond financial health lend importance to the subject.

Subgroup Credit Markets. The credit market has had disproportionate representation amongst demographics. Especially among young adults, females and minorities are found to have lower finan-

cial capabilities⁵(Mottola, 2014) and face higher costs of debt (Wheary and Draut, 2007). Credit card growth is not consistent across generations, with lower socioeconomic young adults taking on more debt in recent years compared to previous generations and engaging in riskier credit behavior (Robb and Pinto, 2011). College attendees are also found to hold the most credit cards but carry less debt (Houle, 2014).

When evaluating credit trends by race, Black and Latino households are shown to have a lower demand for credit (Bradford, 2003), face higher interest rates and have a larger rate of negative outcomes with debt than other races (Freeman, 2017; Ruetschlin et al., 2013; Wheary and Draut, 2007). Studies report that the CARD Act did improve credit behavior and representation amongst the Black population, however it did not diminish the racial disparities in the credit market (Ruetschlin et al., 2013).

CARD Act Evidence. Other studies have found evidence of consumers benefiting from the other CARD Act regulations. In reference to Title I & II provisions, the overall cost of debt was lowered after limiting credit card fees and increasing disclosure on the true price of credit (Agarwal et al., 2015; Bar-Gill and Bubb, 2012; Frank, 2011). Consumers reduced an estimated 1.6% of their average daily balances, with subprime consumers benefiting the most with a 5.3% reduction – resulting in over \$11.9 billion saved in the credit market (Agarwal et al., 2015). The 2015 report by the Credit Financial Protection Bureau (CFPB) estimates savings of \$16.9 in fees, with a 2% cost of debt reduction. However, Bar-Gill and Bubb (2012) show that the cost savings is in the short-run and that in the long-run consumers still face high costs of debt.

Improving credit agreement disclosure was found most effective in reframing minimum payment outlines. Campbell et al. (2011) showed that reframing minimum payment statements to 36-month period lead to higher repayment amounts, benefiting subprime consumers most. Another study found that the improved disclosure on price transparency is also beneficial by stating accurate prices on solicitations (Frank, 2011).

⁵Access and utilization to financial tools such as mortgage, retirement accounts, financial literacy, disposable income consumption

2.2. Credit Card Accountability Responsibly and Disclosure Act of 2009

The Credit CARD Act was first introduced in 2008 by Representative Carolyn Maloney as the Credit Cardholders Bill of Right Act. The bill passed the House of Representatives but did not make it to the Senate. Soon after the failed attempt, the bill was reintroduced as the Credit CARD Act at the beginning of 2009, passing through both the House of Representatives and the Senate in the following months. On May 22nd, President Obama signed the Act into law and a majority of the amendments took effect on February 22nd, 2010.

CARD Act Amendments. The Credit CARD Act is intended to amend sections of the Truth in Lending Act of 1968 following the recession in 2008. The Truth in Lending Act is focused primarily on promoting transparency between credit providers and consumers. Laws were established to aid consumers in understanding the true cost of debt before entering into a credit agreement.

The amendments of the CARD Act are separated into five titles: Consumer Protection (I), Enhanced Consumer Disclosure (II), Protection of Young Consumers (III), Gift Cards (IV) and Miscellaneous Provisions (V). Title I focuses primarily on regulating credit lending practices such as limiting interest rate increases⁶ and fees associated with tardy payments. Additionally, the title restructured payment allocation to apply the excess of minimum payments to the principal balances with the highest interest rate.

Title II ensures complete disclosure of time-sensitive information, such as payoff and late payment deadlines, to prevent deceptive marketing practices.

Title IV concerns the provision and regulation on gift cards, as the title suggests. Title V contains all further amendments that do not fall under the other titles.

2.2.1. Title III - Protection of Young Consumers

For this study, I will be concentrating on the provisions in Title III. This title, unlike the others, restricts young consumers access to credit rather than focusing on the responsibility and accountability of the lenders. The five subsections of Title III impose restrictions on young individuals and marketing practices surrounding college campuses. The most notable, in reference to this paper, are sections 301 & 304. Section 301, *Extensions of Credit to Underage Consumers*, prohibits the

⁶However, there were no caps set on how much the lenders could increase interest rates.

procurement of credit cards to individuals less than the age of 21 unless they 1) submit a handwritten application, 2) have a cosigner that is over the age of 21 that assumes joint liability of the credit, or 3) can indicate an independent means of repayment⁷. Prior to the Section 301 amendment, individuals aged 18 or older could apply for a credit card without securing a cosigner and were assessed on household income rather than individual income. Section 303 (*Issuance of Credit Card to Certain College Students*) further adds that the cosigner must provide written approval for increases in credit and extends the joint liability.

Section 304, *Privacy Protections for College Students*, imposes marketing restrictions on college campuses. Full disclosure on the location and marketing practices must be provided to the college, in addition to prohibiting inducements that can lure college students to apply for a credit card.

The remaining sections, Section 302 (*Protection of Young Consumers from Prescreened Credit Offers*) and Section 305 (*College Credit Card Agreements*), are aimed at safeguarding young consumers from additional harmful ploys from creditors.

It is important to note that the vocabulary and intent of the Title III amendments are centered around college students (Sections 303-305). There is a clear concern about college student debt, therefore warranting these amendments to come to fruition. I aim to investigate how this act affected *all* young consumers, including those who are not college students. If the Act was intended to resolve credit issues amongst college students, this may have restricted access to credit for those who might behave differently but are under the same restrictions.

The requirement a cosigner can create the discrepancies between college and non-college students, as well as the various subgroups. The cosigning barrier is highly dependent on familial conditions⁸ and can be independent from personal financial behavior. Attending college comes with high costs that may signal a higher chance of securing a cosigner. The same intuition applies to particular subgroup, where certain characteristics may signal higher chances of a cosigner thus higher probability of a credit card.

⁷This was later changed after consideration for stay-at-home spouses or partners that still had access to appropriate means of repayment. In May 2013, this section was later amended to allow consumers to be considered under household income if they had reasonable expectation of access.

⁸Family household income, education, credit history, etc.

III. Data

The data source used in this analysis is from the Panel Study of Income Dynamics (PSID). The PSID is the oldest running longitudinal study in the world, conducted by the Institute for Social Research at the University of Michigan. The longitudinal study manages various household surveys throughout the United States through supplemental components. This study uses data primarily from the Transition into Adulthood Supplement (TAS), in addition to data sourced from the Main Interview (MI) and Childhood Development Supplement (CDS).

Panel Study of Income Dynamics. The PSID collects nationally representative panel data on households and its members, starting in 1968 with the Main Interview. Each household is surveyed biennially on varying demographic and behavioral questions. In 1997, the CDS began as an extension to the Main Interview, surveying the children of the initial households aged 0-12 at the time. The CDS surveys childhood development factors and outcomes. In order to bridge the gap between the Main Interview (adult) and the CDS (children) developmental information, the TAS subsequently began in 2005 to follow the same children in the CDS as they enter into adulthood. All the studies ask questions regarding health, employment, education, finances, and behavior along with other topics.

Surveys are distributed in waves, often leading to different observations depending on the year. For example, if an individual answered a survey question in one year and then the same question is asked in the subsequent year, the observation will not be reported given the assumption that the observations remains unchanged from year to year (categorical variables). The data was manipulated to overcome wave reporting, capturing the subsequent year observation if the issue was present.

3.1. Transition Into Adulthood Supplement

The panel used in this estimation is from TAS surveys conducted biennially from 2005–2015. There are 2,893 individuals surveyed, totaling in 17,358 observations. Starting in 2005, the age ranges from 6 years old to 20, with a balanced panel throughout the ten years (Table 1). There are limited variables available in the TAS but because the participants are directly sourced from the CDS and Main Interview, I combine additional variables from those studies. A unique identifier is constructed that can identify the same individual throughout the multiple surveys, allowing a data merge from different sources within the PSID.

Table 1: Survey Age by Year (Full Sample)

Age	2005	2007	2009	2011	2013	2015	Total
6	5	0	0	0	0	0	5
7	162	0	0	0	0	0	162
8	172	5	0	0	0	0	177
9	208	162	0	0	0	0	370
10	210	172	5	0	0	0	387
11	254	208	162	0	0	0	624
12	221	210	172	5	0	0	608
13	235	254	208	162	0	0	859
14	216	221	210	172	5	0	824
15	229	235	254	208	162	0	1,088
16	222	216	221	210	172	5	1,046
17	258	229	235	254	208	162	1,346
18	233	222	216	221	210	172	1,274
19	239	258	229	235	254	208	1,423
20	29	233	222	216	221	210	1,131
21	0	239	258	229	235	254	1,215
22	0	29	233	222	216	221	921
23	0	0	239	258	229	235	961
24	0	0	29	233	222	216	700
25	0	0	0	239	258	229	726
26	0	0	0	29	233	222	484
27	0	0	0	0	239	258	497
28	0	0	0	0	29	233	262
29	0	0	0	0	0	239	239
30	0	0	0	0	0	29	29
Total	2.89	2.89	2.89	2.89	2.89	2.89	17,358

Independent Variables. The variables collected from this panel include information concerning education, employment, credit & debts, race, location, parental demographics, and assets. Credit & debts are of principal importance for this analysis. Data on credit card ownership, responsibly of debt and the amount of debt are included. The remaining data are covariates to account for credit behaviors and unobservable heterogeneities.

Dependent Variables. Credit & debt behaviors are the three dependent variables used in this analysis. OWNCC is the measure of the extensive margin, asking whether or not the individual has a credit card. On the intensive margin, BALCC and VALCC are used to measure credit utilization. BALCC is an indicator variable, asking if the individual has carry-over balance. Given an individual has carry-over balance, VALCC is the value on that balance.

3.2. Descriptive Statistics

The sample used for estimation varies from year to year. Selection into the treatment group and the ability to apply for a credit card rely on age, thus more individuals are added in the estimations

Table 2: Baseline Treatment & Control Dependent Variables

	OWNCC	VALCC	BALCC
Treatment	0.36	280	0.17
<i>N</i>	3748	3745	3750
Control	0.40	2100	0.29
<i>N</i>	3407	3402	3400
Total	0.38	1146	0.43
<i>N</i>	7155	7147	7150

Table 3: Percentage Owning a Credit Card

	2005-2015	Before Act	After Act	Difference
All	35.48	34.02	46.15	12.13
Education				
Attended college	44.85	45.40	43.99	-1.41
Did not attended college	19.46	17.42	20.80	3.38
Gender				
Female	37.67	37.26	37.94	0.69
Male	33.00	30.35	34.75	4.40
Race				
White	44.34	42.26	45.75	3.48
Black	25.00	24.18	25.53	1.35
Other	37.32	35.73	37.12	1.39
Employment				
Employed	41.00	36.70	43.15	6.45
Unemployed	13.71	13.05	14.18	1.13
Student	38.65	39.93	37.60	-2.33

over time. The panel set itself remains constant with the same individuals observed every year, however, whether or not they are used for estimation is dependent on time and age. Certain covariates change over time as well, like education and employment status. As a result, there is a lack of balance between the treatment and control group but for the dependent variables, the estimation sizes are relatively balanced. From Table 2 we can see that the number of observations

for all the dependent variables is similar but we can notice large dependencies between credit card utilization. This can be due to age, the older an individual, the more debt carried (Fulford and Schuh, 2015). Using regression analysis, we can account for these differences using age fixed effects (see ??).

Table 4: Survey Age by Year (Estimation Sample)

Age	2005	2007	2009	2011	2013	2015	Total
18	233	222	216	221	210	172	1,274
19	239	258	229	235	254	208	1,423
20	29	233	222	216	221	210	1,131
21	0	239	258	229	235	254	1,215
22	0	29	233	222	216	221	921
23	0	0	239	258	229	235	961
24	0	0	29	233	222	216	700
25	0	0	0	239	258	229	726
26	0	0	0	29	233	222	484
27	0	0	0	0	239	258	497
28	0	0	0	0	29	233	262
29	0	0	0	0	0	239	239
30	0	0	0	0	0	29	29
Total	501	981	1.43	1.88	2.35	2.73	9,862

Advantages & Disadvantages. The literature surrounding the CARD Act utilizes data reported by financial institutions ⁹ either directly working with or linked to credit, retrospectively examining those who have already entered into the credit market. The advantage of using the PSID panel data is the ability to analyze the effects of the CARD Act on the subjects themselves rather than the change in composition of the credit market. The data is able to capture information on those who did not enter the credit market and observe the same outcomes as those who did, mitigating potential risk of selection bias. However, the TAS lacks substantial power compared to the rich data set provided by these financial institutions.

Another advantage of this data set is the ability to identify siblings within the sample. There is no direct measure reported in the TAS and had to be pulled from the CDS and MI. Using the PSID supplement Parent Identification File, a unique identifier was constructed from the reported

⁹Federal Reserve Bank of New York / Equifax

Table 5: Descriptive Statistics: Baseline (2009)

	Treatment	Control	Total
Number	1935	958	2893
Age	15.2	21.6	17.4
Standard Deviation	2.50	1.17	3.70
Education (%)			
Did not graduate high school	7.54	3.92	5.15
High school graduate	85.15	77.98	82.71
Attended college	63.65	60.75	62.66
Gender			
Female	1465	1486	1465
Male	1428	1407	1428
Employment Status (%)			
Employed	8.47	41.69	19.74
Unemployed	6.59	14.07	9.13
Student	20.61	23.24	21.50
Race (%)			
White	47.62	45.91	47.04
Black	41.33	42.74	41.81
Other	11.62	9.94	11.05

Table 6: Estimation Sample: Before & After Act

	Treatment		Control	
	<i>Before</i>	<i>After</i>	<i>Before</i>	<i>After</i>
Number	445	4011	2463	2943
Age	18.5	20.8	20.2	25.59
Standard Deviation	0.02	0.03	0.03	0.04
Education (%)				
Did not graduate high school	8.98	3.52	8.49	2.58
High school graduate	78.65	83.49	77.95	77.98
Attended college	60.44	63.10	61.06	60.75
Gender				
Female	222	2000	1200	1430
Male	223	2011	1263	1513
Employment Status (%)				
Employed	25.84	38.52	36.33	25.59
Unemployed	13.71	10.60	11.36	5.50
Student	46.07	28.97	32.19	8.94
Race (%)				
White	45.15	44.38	46.49	46.31
Black	41.76	41.43	43.40	43.83
Other	13.09	14.17	10.09	9.85

mother and fathers 1968 Identification Number and Person Number. Matching the mother and father unique ID to each child in our sample, I was able to match the children who had the same mother and/or father. Under the synthesized familial tracking, there was a reported 1,135 matched siblings via mothers and 893 via fathers. Out of the 1,135 matched siblings (argmax mother & father), there are 1001 with the same parents, accounting for 88% same parent families.

IV. Methodology

Multivariate regressions are used to measure the effect of the CARD Act on young adults entry to credit behavior. Using difference-in-difference methodology, we can estimate how the treatment group responded to the act relative to the control group. Intuitively, there should be a credit utilization discrepancy between the treated and control. Additionally, I will provide a within-group analysis to determine whether certain covariates were disproportionately affected by the act.

Credit card utilization will be explained through three outcome variables: the probability of owning a credit card (OWNCC), having a credit card balance (BALCC), and the value of the credit card balance (VALCC). The primary outcome variable of interest, OWNCC, is an estimation of entering into the credit card market. This is reported as a dummy variable in the survey, however, it will be estimated as the propensity to having a credit card. The secondary outcome variables, BALCC and VALCC, are both analyzed conditionally and unconditionally on being in the credit market. These are used to measure the extent of credit utilization, and if the act had a causal effect on the amount of credit utilized. Conditional on already having a credit card, I want to analyze whether there was an adjustment to the credit consumption. Unconditionally, how did the treatment and control group credit behavior change the Act?

There are two methods I use for selecting the treatment and control group in this paper. The first analysis will use a treatment dummy variable based on the cut-off age of 21 at the time of the act, separating the individuals into two groups. The second analysis parameterized a continuous variable ¹⁰ that measures the partial exposure to the Title III restrictions. Due to the nature of this panel data set, those aged between 18-21 at the time the act came into effect were only partially exposed. Once they come of age, the restrictions no longer apply, potentially resulting in different outcomes.

¹⁰Assuming a linear exposure effect

4.1. Treatment Dummy Variable Regression

The base regression takes form as:

$$OWNCC_{ith} = \beta_0 + \delta(Treatment_i * After Act_t) + X'_{it}\gamma + \theta_h + \tau_t + e_{it} \quad (1)$$

with $OWNCC_{it}$ as the variable of interest. $X'_{it}\gamma$ serves as a vector of controls that account for the observable individual covariates, both static and time variant. I am controlling for education, gender, state, and race. θ_h accounts for family fixed effects in the model. τ_t are time fixed effects. The time fixed effects are pertinent to the model due to the timeliness of the implementation of the CARD Act. This will minimize the error associated with the changing economy at the time. This, and all other regressions, are clustered at the individual level to further minimize the standard errors.

Family Fixed Effects. Siblings are both surveyed in the TAS, allowing for this study to control for family fixed effects. When controlling for family fixed effects, we can account for family heterogeneities and compare credit constraints amongst siblings. If one sibling is in the treatment group while the other is in the control group, we can compare siblings directly and capture the effect in the interaction variable. In order to incorporate this into the regression, I will be using the absorb function, with θ_h being a vector of all family dummy variables, for the treatment dummy variable and partial exposure regressions, clustering at the family level rather than the individual level.

4.2. Partial Exposure Regression

Defining the treatment group in our study can be highly sensitive to age. When using a dummy for treatment, there is a clear separation between being exposed to the act and not being exposed to the act. Once an individual comes of age at 21, they are technically no longer restricted by Title III and can obtain a credit card without the need of an adult cosigner.

Exposure to the treatment is a continuous variable constructed from the number of months you were in the treatment group. Once over the age of 21, a respondent exits the treatment group and enters into the control. In order to capture the cases in which there is partial exposure, I constructed a variable EXP_i (exposure) to measure of the length of treatment in months. Individuals that are under the age 18 when the act was initiated will have full exposure ($EXP_i = 1$) while those that

are over the age of 21 at the act will be in the control ($EXP_i = 0$). Those in between are treated as partial exposure is based on their age in months at the time of the act, divided by the number of months through the survey period that they can exit the treatment group. The act came into full effect on February 2010, and the survey sample extended to 2015, therefore EXP_i is a proportion of the months until the individual turns 21 to the 72 months (see equation 4.2). Age is not reported in the TAS, but individuals can be tracked by the unique identifier in the overall larger PSID data, I used the age reported from the CDS and calculated the nominal birth month and year. Age was reported in months at the time of the CDS survey, September 1999.

$$Exposure_i = \begin{cases} 1 & \text{if Age} < 18 \text{ at CARD Act} \\ \frac{\# \text{ months to 21}}{72} = \theta & \text{if Age} \in [18, 21) \\ 0 & \text{if Age} \geq 21 \text{ at CARD Act} \end{cases} \quad (2)$$

The partial exposure regression is similar to the base regression:

$$OWNCC_{ith} = \beta_0 + \varphi(Exposure_i * After Act_t) + X'_{it}\gamma + \theta_h + \tau_t + e_{it} \quad (3)$$

The same fixed effects and controls are incorporated into this regression. The interaction term φ is a function of the parameterized exposure measure and time after the act.

4.3. Subgroup Analysis

In efforts to examine whether the Act had a disproportionate effect amongst demographics, I test demographic samples with the same regressions (see equation 4.1) and compare the interaction coefficients. Subgroups are separated by whether they attended college, reported gender, race and employment status. Title III focused sections of the act specifically towards college students, which may have affected those who did not attend college separately. The revision of the ability-to-pay amendment was necessary – for example, stay-at-home spouses were unable to gain credit even though they had the ability to do so. This effect on (primarily) women may be captured when comparing their treatment effect. There is a disproportionate representation of race in the credit markets (Bradford, 2003) – added restrictions may have been more powerful on some races than the others that are already misrepresented in the market. Whether or not you are employed can greatly

affect the ability to own a credit card, having income will increase the chances of obtaining a credit card. Relative to the CARD Act, how were the unemployed affected relative to the employed.

I will be conducting a within-group estimation, restricting the sample sizes by their respective subgroup and comparing the interaction coefficient. Equation 4.1 will be used for this estimation. The subgroups will be examined by race, gender, education, and employment. Subgroups will have smaller sample sizes, therefore the power of the coefficients will be inherently weaker.

For family fixed effects subgroup analysis, I will be interacting the difference-in-different treatment effect with the respective subgroups (see equation 4.3). The analysis will differ because the interpretation is between siblings in both the treatment/control group and differing subgroup.

$$OWNCC_{ith} = \beta_0 + \beta_1 * Gender_f + \beta_2 * Gender_f * (DID_{it}) + \varphi(Exposure_{ei} * After Act_t) + X'_{it}\gamma + \theta_h + \tau_t + e_{it} \quad (4)$$

4.4. Credit Utilization

Similar to owning a credit card, there is a dichotomous measurement of having carry-over balance on a credit card in addition to the value on that balance. Given credit card ownership, I want to estimate whether or not credit is utilized and to what extent. This will be estimated on both an extensive and intensive margin, how did those within the credit market change their behavior with the act as well as comparing the utilization of credit between minors and non-minors. When doing the extensive margin analysis, those that do not have a credit card will be treated as a zero and included in the estimation. The intensive margin analysis will exclude individuals who do not have a credit card from the estimation sample to see how the utilization changed. The same methodology applies towards measuring the change in the value of the carry-over balance.

The regressions for carry-over balance are:

$$\begin{aligned} BALCC_{it} = \beta_0 + \beta_1 Last Year Earnings_{it} + \beta_2 Has Savings Account_{it} \\ + \varphi(Treatment_i * After Act_t) + X'_{it}\gamma + \tau_t + e_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} VALCC_{it} = \beta_0 + \beta_1 Last Year Earnings_{it} + \beta_2 Has Savings Account_{it} \\ + \varphi(Treatment_i * After Act_t) + X'_{it}\gamma + \tau_t + e_{it} \end{aligned} \quad (6)$$

Both BALCC & VALCC are estimated using the same independent variables. Last year earnings is a nominal measurement of income in the past year. Having a savings account is incorporated in the regression to measure if there is a correlation between having a savings account and utilizing debt. The same covariates and fixed effects that were used in the previous regressions in these estimations as well.

V. Results

5.1. Baseline Treatment Dummy Results: Owning a Credit Card

There is no statistically significant evidence that the CARD Act had any effect on the probability of owning a credit card after accounting for covariates ¹¹ and fixed effects. Table 7 shows the initial baseline results, for both the treatment dummy and partial exposure. There are few interaction coefficients that are statistically significant, with all being negative, indicating a decrease in the probability of owning a credit card relative to if they were not restricted under the CARD Act.

Table 7: Interaction Coefficient Comparison

Parameter	Treatment Dummy				Partial Exposure			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interaction	-0.0250*	-0.0188	-0.0251	-0.0287	-0.0647***	-0.0224	-0.0351	0.0133
	(0.0148)	(0.0132)	(0.0280)	(0.0403)	(0.0169)	(0.0164)	(0.0373)	(0.0700)
Cluster Level	Individual	Individual	Individual	Family	Individual	Individual	Individual	Family
<i>N</i>	7,155	7,126	7,126	6,284	7,155	7,126	7,126	6,284
<i>R</i> ²	0.001	0.147	0.149	0.521	0.003	0.147	0.149	0.521
Covariates	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Family FE	No	No	No	Yes	No	No	No	Yes

In the initial baseline treatment dummy results (Table 8) we can see that being under 21 reports an 8.61% decrease in probability, while after the act is a 4.90% increase. In combination with the 1.72% increase for the interaction, the summation of the coefficients results in a decrease of 2.50% for the difference-in-difference in the probability of owning a credit card. Though this is a promising

¹¹State controls not reported, there is a balanced representation but a small sample from each state

result, the initial regression is heavily flawed by not controlling for covariates that can influence out outcome. When controlling for covariates in the regression, the R^2 increases, however, the statistical significance on the interaction coefficient is lost.

The coefficients on the age controls show that the older the individual, the increase in the probability of owning a credit card. At age 19, there is a 7.88% increase followed by 8.02%, 13.1%, 11.5%, 16.9%, 14.8%, 19.1%, 13.3%, 55.6% respectively. This falls in line with the intuition that the demand for credit increases as one gets older, as well as the assumptions presented by (Fulford and Schuh, 2015). Attending college increases the probability by 24.4%. Assuming income increases with education, the less likely the barrier of the ability-to-pay provision. Adding an element of race creates a negative relationship, with a 14.2% decrease for Blacks and 8.19% for other.

In Model III, year fixed effects were added to account for recessionary effects. The only significant results are for 2007, which happens to be the year before the recession occurred, with a 4.16% increase in probability. This can be a reflection of the large uptake of credit cards prior to the recession (Garriga et al., 2017). The point estimates for the covariates remained similar to Model II in both value and significance, and the interaction remained insignificant.

In Model IV, the family fixed effects were incorporated into the regression. The interaction term has a larger negative magnitude but substantial standard errors resulting in a null coefficient. There is a decrease in the number of observations due to measurement error in the family tracking (see Data), leading to weaker power and a loss of significance in the control estimates.

While the main variable of interest did not have statistical significance, all the coefficients indicated a negative relationship with relatively similar point estimates. While a statistical interpretation does not hold in this case, the effect trend is persistent amongst the regressions.

5.2. Baseline Partial Exposure Results

The results of partial exposure (Table 9) are similar to the results of the baseline treatment dummy regression. The interaction variables are insignificant, indicating no treatment effect from the CARD Act. These results could imply misspecification of the model used to capture the partial exposure. The current model assumes a linear relationship between treatment exposure weight and age but the magnitude could take non-linear form and have a varying weight depending on the length of exposure. There was no particular difference in the R^2 with larger the standard errors implying a forced exposure shape.

Table 8: Baseline Treatment Dummy Results - Probability of Owning a Credit Card

Parameter	Model I	Model II	Model III	Model IV
	(1)	(2)	(3)	(4)
Under 21 [†]	-0.0861*** (0.0265)	-	-	-
After Act	0.0490*** (0.0161)	-	-	-
Under 21 [†] * After Act	0.0172 (0.0277)	-0.0188 (0.0132)	-0.0251 (0.0280)	-0.0287 (0.0403)
Age				
19	-	0.0788*** (0.0188)	0.0774*** (0.0188)	0.101*** (0.0358)
20	-	0.0801*** (0.0172)	0.0790*** (0.0176)	0.101*** (0.0261)
21	-	0.131*** (0.0196)	0.130*** (0.0201)	0.169*** (0.0403)
22	-	0.116*** (0.0196)	0.123*** (0.0217)	0.173*** (0.0384)
23	-	0.169*** (0.0209)	0.178*** (0.0234)	0.221*** (0.0492)
24	-	0.149*** (0.0220)	0.152*** (0.0291)	0.204*** (0.0534)
25	-	0.191*** (0.0230)	0.193*** (0.0313)	0.215*** (0.0642)
26	-	0.136*** (0.0430)	0.131*** (0.0505)	0.244*** (0.0816)
27	-	0.556*** (0.0532)	0.557*** (0.0610)	0.964*** (0.0689)
Attended College	-	0.244*** (0.0144)	0.244*** (0.0144)	0.164*** (0.0411)
Female	-	-0.0219 (0.0138)	-0.0219 (0.0138)	-0.0362 (0.0339)
Race				
Black	-	-0.142*** (0.0177)	-0.142*** (0.0177)	0.00330 (0.0866)
Other	-	-0.0821*** (0.0230)	-0.0806*** (0.0231)	0.00562 (0.0622)
Year				
2007	-	-	0.0415* (0.0251)	0.0177 (0.0335)
2009	-	-	-0.0237 (0.0257)	-0.0686* (0.0407)
2011	-	-	-0.0185 (0.0332)	-0.0543 (0.0572)
2013	-	-	-0.00211 (0.0386)	-0.0485 (0.0706)
2015	-	-	0.0216 (0.0438)	-0.0189 (0.0855)
Cluster Level	Individual	Individual	Individual	Family
Observations	7,155	7,126	7,126	6,284
R-squared	0.004	0.147	0.149	0.521
Cluster Level	Individual	Individual	Individual	Family
Covariates	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
Family FE	No	No	No	Yes

When incorporating family fixed effects, the interaction term points to a positive coefficient. This trivial point estimate is still statistically insignificant but differs from the other interaction values. This implies that the treatment group is 1.33% more likely to own a credit card after the act.

5.3. Credit Utilization Results

There is no effect on the credit utilization for the treatment group on both the extensive and intensive margins (Table 10). The point estimates remain negative on the interaction coefficients but are again statistically null. At the extensive margin, there is an implied 3% fewer carry-over balances with a \$137.80 difference from the control. At the intensive margin, there is a 2% change in carry-over balances and a \$251.80 reduction in value. From Table 2, we see that \$137.80 is over half of the average carry-over balance for the treatment group, implying a huge reduction in utilization if significant for minors but for non-minors, the proportion is smaller with the average carry-over balance being \$2,100. Since these estimates lack the statistical significance, we can not conclude that there were changes in credit utilization.

Age is a significant factor for the value and likeliness of having a carry-over balance, similar to the results of owning a credit card (Tables 8 & 9).

Attending college increases carry-over balances by 9.52% on the extensive margin and increases the value of those balances by \$853 and \$672 on the extensive and intensive margin respectively. Being female decreases carry-over balances across the board, indicating a difference in credit behavior in this case.

Race was not significant except in terms of having a carry-over balance within the credit market, with a 6.5% higher likeliness if the individual were Black.

The coefficients on the year fixed effects reflect the behavior of the credit market over time. There is an increase in debt in 2007, with a higher probability of having a carry-over balance. In 2009, there is a large downward shift in debt, decreasing the amount and persisting throughout the survey years. This agrees with Garriga et al. (2017) where debt was heavily used prior to the recession and took a large turn afterward.

Employment shows results only on BALCC, indicating a decrease of 6.6% in having carry-over balance on the extensive margin and a 15.7% decrease conditional on being in the credit market if the individual is employed.

Table 9: Baseline Partial Exposure Results

Parameter	Model I	Model II	Model III	Model IV
	(1)	(2)	(3)	(4)
Under 21 [†]	-0.440*** (0.120)	-	-	-
After Act	0.0479*** (0.0150)	-	-	-
Under 21 [†] * After Act	0.337*** (0.121)	-0.0224 (0.0164)	-0.0351 (0.0373)	0.0133 (0.0700)
Age				
19	-	0.0769*** (0.0189)	0.0744*** (0.0191)	0.103*** (0.0373)
20	-	0.0772*** (0.0171)	0.0742*** (0.0186)	0.105*** (0.0289)
21	-	0.126*** (0.0197)	0.121*** (0.0227)	0.174*** (0.0480)
22	-	0.111*** (0.0198)	0.116*** (0.0258)	0.186*** (0.0478)
23	-	0.162*** (0.0213)	0.165*** (0.0304)	0.237*** (0.0656)
24	-	0.143*** (0.0224)	0.141*** (0.0361)	0.231*** (0.0701)
25	-	0.185*** (0.0237)	0.181*** (0.0406)	0.246*** (0.0864)
26	-	0.132*** (0.0433)	0.121** (0.0563)	0.283*** (0.100)
27	-	0.555*** (0.0534)	0.552*** (0.0644)	1.008*** (0.0867)
Attended College	-	0.244*** (0.0144)	0.244*** (0.0144)	0.163*** (0.0413)
Female	-	-0.0219 (0.0138)	-0.0219 (0.0138)	-0.0357 (0.0339)
Race				
Black	-	-0.142*** (0.0177)	-0.141*** (0.0177)	0.00430 (0.0867)
Other	-	-0.0819*** (0.0231)	-0.0801*** (0.0231)	0.00771 (0.0620)
Year				
2007	-	-	0.0443* (0.0254)	0.0122 (0.0358)
2009	-	-	-0.0188 (0.0275)	-0.0773 (0.0487)
2011	-	-	-0.0169 (0.0352)	-0.0848 (0.0705)
2013	-	-	0.00215 (0.0429)	-0.0900 (0.0900)
2015	-	-	0.0284 (0.0501)	-0.0707 (0.111)
Cluster Level	Individual	Individual	Individual	Family
Observations	7,155	7,126	7,126	6,284
R-squared	0.007	0.147	0.149	0.521
Cluster Level	Individual	Individual	Individual	Family
Covariates	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
Family FE	No	No	No	Yes

Table 10: Credit Utilization: Extensive & Intensive Margin

	BALCC		VALCC	
	<i>Extensive</i>	<i>Intensive</i>	<i>Extensive</i>	<i>Intensive</i>
Under 21 [†] * After Act	-0.0335 (0.0321)	-0.0210 (0.0526)	-137.8 (145.1)	-251.8 (245.6)
Age				
19	0.0735*** (0.0190)	0.0652 (0.0401)	653.0** (260.4)	768.0 (649.6)
20	0.0996*** (0.0189)	0.135*** (0.0395)	589.2** (259.4)	398.7 (640.4)
21	0.123*** (0.0218)	0.153*** (0.0419)	1,389*** (416.2)	2,438*** (936.9)
22	0.142*** (0.0233)	0.180*** (0.0459)	1,141*** (255.9)	1,772*** (617.7)
23	0.172*** (0.0265)	0.172*** (0.0485)	1,135*** (233.7)	1,394** (569.3)
24	0.147*** (0.0346)	0.182*** (0.0588)	1,137*** (256.7)	1,586*** (578.7)
25	0.197*** (0.0367)	0.226*** (0.0622)	1,410*** (289.0)	1,929*** (624.5)
26	0.213*** (0.0632)	0.292*** (0.105)	1,241*** (352.4)	1,773** (724.6)
27	0.661*** (0.0458)	0.630*** (0.0751)	102.8 (359.7)	492.2 (667.5)
Attended College	0.0952*** (0.0172)	-0.00509 (0.0339)	853.4*** (152.0)	672.6** (288.0)
Female	-0.0786*** (0.0150)	-0.0797*** (0.0259)	-395.4** (155.3)	-479.3 (293.2)
Race				
Black	-0.0109 (0.0171)	0.0651** (0.0296)	91.45 (187.5)	541.6 (407.0)
Other	0.00199 (0.0226)	0.0193 (0.0375)	-95.18 (242.2)	109.4 (489.0)
Employment Status				
Employed	-0.0661*** (0.0187)	-0.157*** (0.0563)	-161.0 (169.6)	-181.1 (667.9)
Student	-0.00571 (0.0157)	-0.00634 (0.0257)	277.8 (201.3)	237.7 (384.2)
Last Years Earnings	2.43e-06*** (5.58e-07)	5.89e-07 (8.15e-07)	0.00603 (0.00462)	0.00255 (0.00740)
Have Savings	0.0933*** (0.0167)	0.0281 (0.0554)	496.8*** (129.4)	823.0* (430.5)
Cluster Level	Individual	Individual	Individual	Individual
Observations	4,961	2,132	4,954	2,129
R-squared	0.114	0.048	0.111	0.118
Cluster Level	Individual	Individual	Individual	Individual

Surprisingly, last years earnings have no impact on BALCC and VALCC. However, having a savings account increases both BALCC and VALCC with an increase of 9.33% on the extensive margin and increasing VALCC by \$496 and \$823 respectively. This shows a relationship between saving and credit consumption trends on our sample but cannot speak on an overall relationship.

5.4. Subgroup Analysis Results

For the subgroup analysis, I restricted the samples based on demographic factors to see if the act affected certain demographics than others. Table 11 shows that there are no significant treatment heterogeneities found between subgroups. There are slight variations in the interaction point estimates, almost all of which are reported as negative, but no inferences can be made evident from the estimations.

The only trivial estimate is the unemployed coefficient on the treatment dummy regression. Though insignificant, the estimation implies a 4.49% positive treatment effect meaning unemployed individuals are more likely to obtain a credit card after the Act. The sample size for the subgroup is substantially smaller than the others, potentially leading to this trivial estimation.

Robustness Check. In Table 12, I test for the validity of the estimates by performing a robustness check. By excluding 2009 ¹², we see that the interaction coefficient remain negative and the magnitude changes by less than 1% for both the treatment dummy and partial exposure. While the estimates are still not statistically significant, this robustness check contributes to the hypothesis that there is a negative trend for the treatment group from the CARD Act .

VI. Discussion

There was no overall treatment effect from the CARD Act in this paper. While all the point estimates indicated a negative trend between treatment exposure and credit card participation/utilization, there is not enough evidence to suggest that young adults were credit constraint when exposed to the act.

The family fixed effects were incorporated into the model to exploit the advantage of siblings in the panel data. The results fell short of significance, like the other estimations, but provided

¹²Using 2009 as the proxy for the recession. The recessionary effects lasted longer than 2009, however since the survey was conducted biennially, this year is best fit to closely align with the recessionary effects.

Table 11: Subgroup Analysis: Owning a Credit Card

Parameters	Treatment Dummy	Partial Exposure	Family FE (Dummy)
<i>Panel 1: Education</i>			
Attended College	-0.0214 (0.0383)	-0.0418 (0.0504)	-0.0412 (0.0494)
Did not attend college	-0.0395 (0.0380)	-0.0280 (0.0513)	-0.0242 -
<i>Panel 2: Gender</i>			
Female	-0.0211 (0.0418)	-0.0745 (0.0545)	-0.0149 -
Male	-0.0355 (0.0379)	0.00157 (0.0515)	-0.0426 (0.0444)
<i>Panel 3: Race</i>			
White	-0.0214 (0.0436)	0.00739 (0.0621)	-
Black	-0.0259 (0.0398)	-0.0508 (0.0506)	-
Other	0.0291 (0.114)	-0.215 (0.147)	-
<i>Panel 4: Employment</i>			
Employed	-0.0181 (0.0377)	-0.0495 (0.0533)	-0.0241 (0.0709)
Unemployed	0.0494 (0.0507)	-0.00334 (0.0616)	-0.0375 -

a unique analysis to the literature of credit. Parental characteristics can influence credit card behaviors (Xiao et al., 2011) but a major limitation to the data was difficulty in extrapolating parental information that could prove useful in our estimations. With the family fixed effects, we were able to insert dummies to account for unobservable characteristics for each family and capture differences between treated and non-treated siblings. This implementation came with shortfalls of measurement error as well as further limiting usable observations. If the set of siblings were not present in all the specifications of the regression, the interpretation could be misleading or drop out the useful information. The estimations added value to support the hypothesized negative trend, implying a difference between the treatment and control siblings but is not statistical evidence.

The results can be trivial when considering the element of cosigning with family fixed effects.

Table 12: Robustness Check: Excluding 2009

Parameter	Treatment Dummy		Partial Exposure	
	(1)	(2)	(3)	(4)
Interaction	-0.0251 (0.0280)	-0.0129 (0.0299)	-0.0351 (0.0373)	-0.0224 (0.0413)
Cluster Level	Individual	Individual	Individual	Individual
N	7,126	5,890	7,126	5,890
R^2	0.149	0.145	0.149	0.145
Covariates	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
Includes 2009	Yes	No	Yes	No

A negative interaction coefficient can mean two things: the additional requirement of cosigners prohibited the treatment sibling from accessing a credit card when the other sibling did not need one, much like I hypothesized without the family fixed effects; or intuitively, if the family characteristics indicated a higher probability of owning a credit card, the treatment sibling actually might be more likely to get a parental cosigner relative to families with siblings who did not get a credit card.

6.1. Null Results & Statistical Significance

No Effect. The lack of statistical significance can be attributed to various factors or a combination of factors. The first of which is the possibility that there is no treatment effect to be detected in the sample. The CARD Act was intended to protect young adults, college students in particular, from the risk of credit. Because our estimation sample incorporated individuals from varying educational backgrounds, the effect could be diminished by considering individuals as homogeneous consumers. While educational factors were accounted for, the representation of non-college students and those not effected by the other sections of Title III (section 302, 303, 304, 305) could surmount the effect found by [Debbaut et al. \(2013\)](#) who looked exclusively at college students.

Exclusion of Sample Weights. The exclusion of sample weights could have biased the estimates towards null results. The decision to not utilize a weighted sample is based on the hypothesis

that the effect would be detected amongst this particular sample given the types of credit behavior questions the survey asks. The PSID is a nationally representative sample but in the initial 1968 household survey (MI), the sample was concentrated in low-income households. In this paper, I followed the assumption that the households used in the TAS sample differed in composition and reverted to a nationally representative sample both in terms of demographics and income status (see Table 6). Using the difference-in-difference estimation, the separation between the treatment and control groups should have mitigated the issue of weights, if needed.

Lack of Power. The second, and more likely scenario is that there is a substantial lack of power and additional observations are needed to detect a treatment effect. Our results showed that a negative trend is, indeed, present and the all point estimates are around a 1-3% difference. Coupled with the robustness checks, the coefficient signs suggest an approximation to a true-mean negative treatment effect. [Debbaut et al. \(2013\)](#) utilized a thorough dataset with considerable strength in power and numbers. The results in this paper are in the same direction as the literature and may lack the power to achieve statistical significance.

Recessionary Effects. The third is the difficulties in accounting for recessionary effects. [Agarwal et al. \(2015\)](#); [Consumer Financial Protection Bureau \(2015\)](#); [Debbaut et al. \(2013\)](#) discussed similar difficulty in separating the economic downturn with the effect of the act. I attempted to separate by using year fixed effects to capture disruption from the recession but further extrapolation may be needed to isolate the CARD Act effects. The change in credit behaviors discussed by [Brown et al. \(2013\)](#); [Federal Reserve Bank of St. Louis \(2014\)](#); [Garriga et al. \(2017\)](#) could be independent of the CARD Act and moreover residual response from the recession. The overall decline of credit usage and demand may have been prolonged through the sample years, reducing the treatment effect in such a small sample.

VII. Conclusion

The aim of this paper was to find weaknesses of the CARD Act in serving young adults and particular demographics in the credit market. This paper inadvertently concludes that the CARD Act had neither positive nor negative impacts on either area of interest. I compare the probability of owning a credit card and credit utilization using a difference-in-difference estimation with fixed

effects between minors (treated) and non-minors (control) during the CARD Act. While a negative difference between the treatment and control group is present and consistent throughout the estimations, there is not enough evidence for a statistically significant impact to be detected.

This paper can contribute to the literature concerning credit behaviors of young adults as well as provide insight on the suitability of a difference-in-difference implementation on for this of analysis. While our variable of interest, the interaction term that captures the differences between treatment and control, were insignificant, covariates associated with credit indicated disproportion in the credit market as a whole and can signal discrepancies with credit usage on general terms. Further research could exploit these discrepancies and investigate why credit is used by certain demographics and not others. In regards to the suitability of the methodology used in this paper, it is difficult to isolate the impact of the CARD Act on credit from recessionary effects. The implementation of difference-in-difference strategy with year fixed effects allows us to compare marginal changes in credit utilization, accounting for unobservable measures that each year entails, however, this proved ineffective in our analysis.

Results regarding policy evaluation, whether significant or null, can provide valuable information to guide future policy direction. The CARD Act was established to ensure responsibility for both creditors and credit consumers, with Title III aimed at protecting young consumers. Because no causal relationship was found, this begs the question as to whether the CARD Act reached its intended motivation at all.

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