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## The Effect of Payment Method on Consumer Behavior During Economic Crises

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THE EFFECT OF PAYMENT METHOD ON CONSUMER BEHAVIOR DURING  
ECONOMIC CRISES

by

Abira Naeem

\* \* \* \* \*

Submitted in partial fulfillment  
of the requirements for  
Honors in the Departments of Economics

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June 2023

## ABSTRACT

Naeem, Abira. The Effect of Payment Method on Consumer Behavior During Economic Crises.  
*Advisor: Zachary Rodriguez*

The aim of this thesis is to delve into the machinations of consumer payment choices during times of crisis. This thesis, additionally, examines the ways in which gender may play a role in varied payment method use, during crises. Consumer payment choices are characterized by the decisions individuals or households make, surrounding their utilization of various payment instruments in circulation. Common payment instruments include, but are not limited to, cash, checks, debit, and credit. Existing research and literature of payment choice split trends on the utilization of payment instruments into long-term, *adoption* observations, and more sporadic, *use* categories. Adoption and use of payment methods, individually, help to paint a clearer picture of the changes and continuities in how consumers interact with various payment methods, over time. Analyzing consumer payment choice, and how it may differ across genders, provides valuable insight on how the state of the economy impacts regular and long-term consumption and transaction patterns. Although the bottom line is that most crises cause inevitable shocks to consumption-related behaviors, the nature of the crisis in question plays an integral role in the extent and ways in which consumption is ultimately altered. Examining both the financial crisis that occurred from 2007 to 2009, and the 2019-2020 COVID health crisis in this thesis, provides two disparate natures of crises that result in devastation to economic conditions, and altered consumption patterns. A review of the literature reveals that employment, or the lack thereof, during times of economic downturn, plays a role in the net changes in consumer payment behaviors. Employment is what shapes income levels, which can either restrict or enable certain consumers from utilizing, or acquiring, certain payment methods. The financial crisis was revealed to have more impacts on male employment, while the COVID crisis impacted female employment more heavily. Analysis of gender provides a unique vantage point for looking at payment decisions, aside from observing general trends that exist for adoption and use of differing payment instruments. This analysis expands on literature on consumer payment behavior through the observation of cross-sectional survey data, reflecting measures of adoption and use of payment methods in years of, and after, the onset of both crises in question. Apart from observing the interactions that a range of explanatory variables have on either the adoption or use of commonly used payment methods, assessment characteristics of each payment method (i.e. convenience, or ease of use) will also be analyzed to better understand consumer perceptions of payment instruments being utilized. I intend to use these observations to find points of both similarity and differentiation in payment behaviors between financial and health crises, with additional consideration being placed on gender-based implications on payment instrument adoption and use. Data for this thesis will be extracted from Atlanta Fed's *Survey of Consumer Payment Choice* (SCPC), which provides yearly data geared toward observing changes in payment preferences over time.

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## CHAPTER 1 INTRODUCTION

### I. Background

Payment choice plays a role in every consumer's life. At the point of sale, individuals find themselves picking and choosing between a variety of payment instruments, to carry out routine transactions within the market. It is imperative to analyze consumer payment choices and behaviors, to foster a greater understanding of how and why certain payment instruments warrant longer-term use, while others are seen more favorably for short-term use. The two-step, adoption and use method of examining payment behavior helps in distinguishing which payment methods and choices are more heavily ingrained within consumption, and which methods are used more periodically but have the potential to become more utilized in time to come. Economic researchers, such as Schuh and Stavins, are proponents and users of a two-step analysis approach for consumer payment choice (2011), as noted in their contributions to the Survey of Consumer Payment Choice (SCPC). Characteristics on perceived efficacy of payment instruments, such as convenience, accessibility, and security levels, help in further understanding consumer payment choice.

Pertinent to times of crisis, typical trends within the larger economy are widespread shocks to employment, decreased consumer confidence, and drops in income on both individual and household levels. Both the financial crisis of 2007-08, as well as the COVID health crisis of 2019-20 identified with having characteristics associated with typical economic downturn, however, shocks to employment, especially, acted as an impetus for consumer payment behavior variations during both crises. The financial crisis of the early 2000s is notorious for its association to "the Great Mancession," which resulted in a significant cut in male-dominated job opportunities being available. On the other hand, the COVID crisis is known for female labor

becoming increasingly domestic, due to the lack of childcare and educational services during the peak of the pandemic.

Observing gender's association with adoption and use of various payment methods during crises would provide clarity on if crisis-related employment and income shocks truly play a role in payment preferences over time. This thesis will be focusing on adoption and use trends for checks, debit, and credit. Since payment methods can also be used as proxies to financial control and dominance within households, important information on household power dynamics between men and women can be revealed through observing gender and payment choices. The inherent differences in risk tolerance and aversion between both genders would provide valuable insights on how crises may or may not alter payment behaviors between men and women.

I hypothesize that during the financial crisis, due to higher shocks to male employment prospects, men will have more sustained use of credit more than debit, and lower check utilization than usual. During the COVID crisis, since female employment was heavily displaced, I predict that women will have higher credit and check use and adoption rates, with lower debit usage. To a rational consumer, credit is used as a fail-safe method of payment, which can also imply that during times where flow of income may be more constrained, credit utilization may increase to cover expenses that may not be covered otherwise. When crises hit and employment falls as a net effect, I infer that credit adoption would be more prevalent, given cuts to income being highly likely. Discussed in more depth later in this paper, the data findings on check, debit, and credit adoption and use follow trends that counter those which were hypothesized. Credit adoption and use amongst men, for example, did not have any statistical significance during the financial crisis period, while credit adoption and use trends during the

health crises displayed males as using more credit than females, opposing the original hypothesis.

## **II. Contribution to Existing Literature**

Be it for basic personal necessities, sustenance, or luxuries, transactions are at the core of our lives. Aside from traditional cash transactions, checks, debit, and credit are three payment methods that are commonly used in regular payments at point of purchase. Because of their relevance in everyday consumption patterns, analyzing the frequency of use of various payment methods helps to see if payment-related choices may vary across genders, or in different economic conditions.

Payment choices and behaviors tell us a story of financial conditions of both individuals and households within a certain period of time, and of the overall economy's conditions. The SCPC, for example, provides information yearly, on the different payment methods and transactions carried out by a randomized set of survey respondents. Each year, the pool of respondents changes, therefore diversifying the findings for the cross-sectional data of the SCPC. Analysis of consumers' payment choice is valuable to understanding changeable, sustained, or potential patterns of use for certain transaction methods.

Existing contributions to payment choice literature are displayed by the work of scholars, such as Scott Schuh and Joanna Stavins. Schuh and Stavins co-author several Boston public policy discussion papers among other economists, looking into the yearly SCPC data findings. In Schuh and Stavins' paper on adoption and use of payment methods, the role of payment method assessment characteristics was described to be of great importance in determining how and why consumers pay in the ways that they do (2011). Understanding how accessibility, security, complexity, and convenience impact use of payment methods helps with learning of why

consumers make the payment choices they make on household and individual levels (Schuh and Stavins 2011). Independently, Schuh (2017) has written about the Diary of Consumer Payment Choices (DCPC) also, which looked into the more micro-leveled, day-to-day consumption and payment choices of consumers. The DCPC would explore questions along the lines of, “what percentage of regular payments made by consumers were using credit cards?”, or would sum up the value of debit transactions in cash within a week or month by observing daily consumption patterns of consumers.

Stavins’ contributions to payment behavior literature is displayed in her work for Boston public policy papers as well, and in work revolving credit debt. In a paper titled, “Credit card debt and consumer payment choice: what can we learn from credit bureau data?” Stavins utilizes SCPC data to observe how income levels and demographic attributes play into the function for credit adoption and usage over time, within various populations of consumers (Stavins 2020). Stavins sheds light on how SCPC data, when applied to a two-step [adoption and use] regression model, has the ability to exhibit the risk tolerance and aversion levels of consumers through its payment assessment data, which then allows researchers and economists to put together stories on why certain payment methods may be more preferable or used than others in various economic circumstances (2020).

In a paper on exposure to identity theft impacting consumer payment behavior, Rodriguez and Schuh (2023) utilize SCPC data to match survey respondents to breached Wendy’s restaurant locations, measuring how their adoption and use of cash, debit, credit, and prepaid cards were impacted. SCPC data, in Rodriguez and Schuh’s paper, helped to depict how shifts to more credit use than debit use were short-lived and not adopted over time, and how this shift was a result of perceptions of higher security revolving credit usage being more prevalent



following the data breach (2023). In their analysis of the Wendy's restaurant data breach impacting payment choice, Rodriguez and Schuh utilized a two-step regression model, which regressed adoption and use of each payment method in question, separately (2017). Transaction data helps to better understand the consumers within the economy, and how they are best able to meet their needs, when it comes to payments. External circumstances, such as data breaches, or periods of economic uncertainty, can result in either short or long term alterations in perceptions of certain payment methods in circulation. For example, cash may likely be more favored in periods of economic decline, as it is the primary source of liquidity and is immediately accessible for use. Credit may be more likely to be used in situations where employment and disposable, flowing income streams may be impacted, making an individual more likely to not have funds immediately available for spending.

### **III. Structure of Thesis**

This thesis will be split into a total of five chapters. Chapter two will consist of a literature review, with the following chapter delving deeper into data analysis models and variables used for this paper. Chapter 3 will be a generalized overview of the data, variables, and models in use. The fourth chapter will contain the regression results tables, and the interpretation of statistical findings surrounding consumer payment behavior, relative to a number of different explanatory variables. The fifth and final chapter five will contain concluding remarks, study-related limitations, and future policy implications in forthcoming research.

## CHAPTER 2 LITERATURE REVIEW

### **I. Introduction**

Since the late 1990s, deviating from cash-based payment methods has become more commonplace. Technological innovation and the evolution of traditional retail practices have contributed greatly to individuals and households using non-cash payment methods with more frequency. It is important to examine the payment behaviors of consumers over time, to see if non-cash methods of payment are fully adopted after initial encounters of their use, or if over time, certain payment methods become increasingly utilized in routine transactions.

Within the economy, there are moments of crisis, or shock, that impact individuals and households in multiple aspects. Shocks are attributed to drops in income, high unemployment levels, and an overall decrease in wealth and savings, for many. This literature review seeks to analyze the role that economic crises may play in consumer payment choices and behaviors, looking further beyond previously established trends on higher electronic payment occurring with the progression of time. The two crises being examined in this review will be the financial crisis of 2007-08, and the COVID-19 health crisis of 2019-20. Furthermore, finding how payment choices may differ between men and women during times of economic crises is an important objective of this paper.

A common economic impact of both of the aforementioned crises was a disproportional devastation to either men or women's employment rates. Across the board, employment directly impacts the income levels on both individual and household levels. Looking into different combinations of employment trends and work statuses of men and women during each of the crises in question would help to more fully understand how payment methods may differ between both genders. Looking to see if men, for example, are more likely to default to higher

credit usage and lower debit use during crises of financial nature, while women mirror those same behaviors more so during health-related crises, is an objective of this review.

## **II. Consumer Payment Data and Analysis**

### **a. Introduction to Consumer Payment Behavior Data and General Findings**

As time progresses, consumer payment behavior is becoming better understood by several researchers. Data sources, such as the Survey of Consumer Payment Choice (SCPC), and the Diary of Consumer Payment Choice (DCPC), promote a deeper understanding of cash flow dynamics within US households. Through elaborate questionnaires, the Survey of Consumer Payment Choice provides us with information on household economic conditions, and shifts in payment preferences from cash, to other methods over time. The analysis of financial statements from multiple US households helps to reduce measurement shortcomings that may impede in seeing the full picture of US consumer payment behavior (Samphantharak et al. 2017). Likewise, the Diary of Consumer Payment Choice is another source that presents consumer payment data through recording households' consumption decisions and preferences, on a daily basis.

Consumer payment behavior can be gauged through observing individual or household usage levels for various modes of payment. Over the years, straying away from paper-based payments has been a result of increased information and communication technologies, as well as from innovations in financial markets and banking (Foster et al. 2010). Electronic and other payment alternatives have become more commonplace and convenient in most developed countries. With reference to the Survey of Consumer Payment Choice, there are now nine different types of payment methods used by consumers. Foster et al. (2010) cite the nine most standard types of payment methods as: cash, check, money order, debit card, credit card, prepaid card, bank account number payment, online banking bill payment, and direct from income.

Survey data, specifically from the SCPC, is an excellent resource for estimating payment behavior and payment instrument adoption or use over time. In a working paper on adoption and use of payment methods, Schuh and Stavins (2011) establish that the adoption of payment methods is more directly tied to setup costs and record keeping capacities, while use of payment methods over a period of time is more dependent on the implementation of proper security standards for consumers' transactions. While using nationally representative data from the SCPC, Schuh and Stavins (2011) found the importance of learning about each payment instrument in circulation's characteristics, relative to the average consumer. Looking into traits of payment methods, such as accessibility, complexity, and convenience, helps with further understanding why consumers make the payment choices they make. In practice, survey data contributed to a better understanding of credit card debt relative to consumer payment choice for Stavins (2020). In her paper on credit debt, the rich nature of survey data and its complementary variables allowed her to find how income vulnerabilities and demographic attributes play into the function for credit adoption and usage over time (Stavins 2020). Survey consumer payment data provides valuable insights on individuals' risk tolerance levels, and sentiments toward various payment instruments.

When examining payment choice, long-term adoption of new payment methods for their functional practicality, or usage trends associated with payment methods that may, at some point in the future, become more regularly used, is integral. Several studies on consumer payment choice using surveys propose that an interdependency may exist between adoption of certain payment methods, and merchant acceptance of the payment method in question (Bounie et al. 2017). Bounie et al. (2017) highlight that it is consumer preferences that underpin any merchant-side acceptance of certain payment methods over time. Hurdles, such as those of

network externalities and costs of adoption, are to be considered while analyzing payment behavior over time.

With regard to card-based payments, it holds true that when a larger number of consumers pay by card, a higher level of utility exists for merchants, if they provision terminals at point of sale (Bounie et al. 2017). Along the same line, it is important to closely consider factors such as consumers' geographical locations, transaction types, and sizes of transactions, to understand their payment choices. Between consumer payment usage and merchant payment acceptance, a positive correlation typically exists, especially when payment networks and technological standards are in line with one another, to lower any possibilities of network externalities impeding.

Arango et al. (2015) delve deeper into how merchants and retailers either directly or indirectly incentivize certain payment methods over others at the point of sale. In some instances, rewards credit cards offered by some retailers may result in drastic drops in debit card and cash payments (Arango et al. 2015). The aforementioned is more so direct incentivization for deviating from cash and utilizing credit instead. In other instances, card payments are not at all accepted, leaving cash-based transactions necessary to pay balances. A seemingly strong empirical relationship between the size or value of a transaction and payment instrument choice exists, with small value transactions being paid off in cash more often than not (Arango et al. 2015).

#### b. Consumer Payment Trends Within Crises

Since the start of the 2007-2008 financial crisis, there has been a greater emphasis on monitoring the cash flow dynamics of both individuals and households. Some of the worldwide after-effects of the 2007-08 recession were rising inflation, high unemployment, increased taxes,

and lowered purchasing power. The payment methods consumers choose to utilize are not only shaped by the conditions of the economy that they are contributing to, but are also indicative of how they [consumers] plan to sustain their cash flow going forward, after a crisis.

Of the nine payment methods individuals use, after the occurrence of the financial crisis, Foster et al. share that average consumers had about five different payment methods at their disposal, using about 3-4 of them on a weekly basis (2011). Across the board, the top three frequently used payment methods are cash, debit, and credit cards. By 2009, the financial crisis led to many individuals defaulting to increased cash usage, as in times of financial and economic uncertainty, cash equates to increased liquidity (Foster et al. 2011). Alongside cash itself, cash equivalents, such as prepaid cards and money orders, were also more preferential to consumers after the financial crisis. Debit and credit card usage dropped as variable rates associated with payment cards had the potential to spike and negatively impact one's financial wellness. Having cash at hand can be used to better an individual's financial position, in a time where investments, portfolios, and flowing income streams may not be expanding as much as they would in ideal situations. In times of financial crisis, it is also important to note that supply-side changes for credit [relative to credit lending entities] may directly impact individuals' acquisition of credit instruments more so than in non-crisis times.

The financial crisis of the mid 2000s was not the only impetus for individuals to make changes to their decisions over payment methods. Developments over time for debit, credit, and other payment cards, resulted in consumers potentially gaining rewards for payments they would make via card methods. Rewards and discount programs for debit or credit card companies were growing in popularity, since the number of merchants and issuers of cards increased, and more people found themselves possessing at least one form of a payment card. Rewards associated

with using a credit or debit card would not make individuals spend more, but would simply shift some more of their expenditure onto card methods, rather than cash (Ching & Hayashi 2008). Although rewards can be quite enticing to many, there are also surcharges one may incur as a result of using payment cards more often than cash. Certain merchants and banks charge card users small fees for using payment cards for transaction totals under a certain dollar amount (Stavins 2018). Stavins shares that if a transaction is ten dollars or less, the likelihood of an individual purchasing in cash, by default, will be significantly higher (2018).

With regards to the COVID crisis, debit and credit card use numbers were much higher than that of cash transactions (Foster et al. 2021). Cash usage fell from 82% in 2019, to 74% in 2020, with mobile, person to person payments increasing by 8% from 2019 to 2020 (Foster et al. 2021). The growth in mobile and person to person payment methods during the height of the COVID pandemic was matched by a rise of online purchases made by individuals. The payment trends of the COVID crisis represented a greater reliance on technology and card payments than observable in the 2007-08 financial crises, since many individuals found themselves unable to travel, or needing to send funds quickly to friends and family.

Knowledge of individuals' socioeconomic standings provides insight on their consumer payment behavior and the methods of payments they find themselves utilizing most regularly. Consumers who have low educational attainment, low income, are Latino, and are male are more likely to, for example, prefer using cash payments, more so than card (Stavins 2018). Hernandez et al. also remind us that although cash usage is utilized by those with lower socioeconomic statuses, cash is typically also deemed even more preferable by the underrepresented, due to its tangible, immediate availability for use, and the anonymity of transactions it provides (2014). Sustained employment makes consumers less likely to utilize cash as a preferred payment

method, as they have a greater ability to pay off debts and interests on cards while having sustained cash flow (Stavins 2018). Less educated consumers tend to prefer debit over credit cards, while higher-income and highly-educated consumers prefer credit over debit. The closer one's income level is to 100K, the more likely they are to put their expenses on credit (Stavins 2018).

Consumers' outlooks on controlling their budgets and spending also shapes which payment method they identify to be most optimal for themselves. It holds true that a typical consumer likes to have some level of insight on their total spending, knows the nature and frequency of their spending, and has control over their budget and spending habits. There are many proponents of budgeting and spending solely through cash, as the value in cash that one possesses in their wallets is predetermined and finite, and they can only spend what they physically possess (Hernandez et al. 2014). On the other hand, there are individuals who are equally budget and spending conscious, but would lean toward using a debit or credit card since bank statements and other online tools sponsored by financial institutions and technology provide them plenty of insights on their cash flow (Hernandez et al. 2014). Those who are low-income, have lower educational attainment, or have more restraints on their spending are more likely to use cash as a payment method, as they are more likely to not qualify for or have multiple payment cards or instruments.

### c. Advancement of Payment Methods Over Time

Aside from the rise of technological innovations in financial and banking industries, Grüşchow et al. (2016) share that there is scarce empirical evidence regarding payment costs, relative to payment choice. Regardless, to better understand why consumers decide to use certain payment methods over others, researchers look into concepts such as credit efficiency, and costs



of making payments, with respect to the various types of payment methods. Grüşchow et al. remind us of how there is a higher-than-ever volume of worldwide transactions, that have been contributing to a steadily growing number of internet shoppers.

Retailers and firms' profitability is dependent on their offerings for modes of payment, as business-to-consumer payment handling is required for successful e-commerce transactions (Grüşchow et al. 2016). The need to cater to a larger population of internet shoppers and their payment needs has pushed many to integrate a more diverse array of payment methods. Comprehension of the complexity of various payment methods requires a deep analysis of merchants and the transaction costs associated with each payment method for both merchants and consumers.

Grüşchow et al. find that lower costs are associated with paper-based credit transfers (i.e. debit cards, credit cards, prepaid cards, etc.) since on the end of merchants in the market, setup costs are low. Inversely, cash-equivalent payments (i.e. money orders, checks, etc.) have higher variable costs to merchants, as they require payments to be physically mailed from the customer to the retailer and generally are much more manual in nature. Ultimately, the hypothesis following payment choice is that in ideal economic and financial circumstances, a rational consumer would weigh the costs associated with their payment choice, as the average costs of making a payment are dependent on the quantity of certain goods or services one will purchase or demand.

### **III. Typical Household Consumption Behavior Trends**

With respect to integrated household surveys, cash or liquidity flow data is not always easy to capture via survey methods. Payment behaviors change often, thus they are highly variable statistics. As a key point, however, it generally holds true that any growth or decay of

assets or wealth within households is indicative of household balance sheets being either positive or negative, with respect to savings and budgeting behaviors (Samphantharak et al. 2017). In many respects, levels of non-labor income within households are important to take into consideration. Not every household has non-labor income, and this may be because of a range of social or economic factors. Distribution of non-labor income among households shows us how adequately personal/household demands are met.

Schuh mentions that with respect to consumption, non-labor income sources are highly attributed to savings-related payments one may make throughout their lifetimes, to sustain their monetary resources and meet changing demands over time (i.e. retirement accounts) (Schuh 2017). Households with more non-labor income are more likely to have personal, disposable income levels that are higher, which lead to more sufficient sustenance of the household.

In terms of payment methods, the Diary of Consumer Payment Choice shows that people now use payment methods like credit cards more often, since users are aware of recurring payments and have “revolving debt” (Schuh 2017). Those who use credit cards for regularly occurring payment obligations are mentioned as “convenience users,” as the balances they will owe back on credit are intuitive in terms of frequency, and therefore convenient to place on this method (Schuh 2017).

As household consumption and payment behavior becomes more thoroughly researched, it is more often than not found that payment variation for households depends on transaction sizes, locations of transactions, and timing of payment (Wang & Wolman 2016). The size of a transaction dictates the amount of funds needed to cover costs, and whether or not one will be able to pay balances with cash, a payment card, or electronic payment methods. The location of a transaction indicates which means of payment would be feasible at point of sale; local spending

can be done in-person, with cash-based currency exchange, while if spending is occurring from a distance, there would be more of a benefit and convenience involved for both the consumer and merchant, to engage in payment through card or electronic payment means. Lastly, time is an indicator of the frequency of spending, or whether or not the spending is happening in the short, medium, or long run. Frequency or time of spending shapes one's demand for money and which payment method is used to cater to immediate or planned financial needs.

There are certain zip codes around the US that indicate either higher or lower income levels, therefore, geographical location plays a role in which payment methods consumers lean toward. In zip codes with a higher density of lower income individuals or households, it holds true that they are more so underbanked (have fewer financial intermediaries around), and host a greater amount of small-dollar transactions, predominantly carried out via cash (Wang & Wolman 2016). Relevant to zip code data, the variable of population density speaks on how payment method adoption and use trends of consumers are dependent on the amount of business activity within an individual's own and neighboring zip codes or municipalities (Wang & Wolman 2016). It can be hypothesized that the adoption and usage of electronic payment instruments would be greater in more densely populated areas/zip codes, where larger bank branches, stores, and businesses exist to offer a variety of payment methods for consumer satisfaction.

#### **IV. Crisis Literature**

Analyzing and understanding the literature behind crises helps to create a more nuanced image of how they [crises] may impact consumer payment behaviors. Just as any sources of adversity would prompt, crises within our economy result in an overall "response" being evoked

within the bearers of the dilemma. The responses of individuals may vary, based on the nature of the crisis at hand.

Crisis management literature seeks to categorize crises by the nature of their onsets, and their consequent impacts. Williams et al. (2017) introduce crises as being of two possible natures—crises as events, or crises as processes. When a crisis appears as an event, there is a low probability of its occurrence, it is unpredictable, and it is high-impact in nature (Williams et al. 2017). A notable property of a crisis as an event would be that the crisis has a distinguishable origin, despite the ambiguity surrounding the event's initial occurrence (Williams et al. 2017).

On the other hand, Williams et al. define crises that occur as processes as events which cause devastation to individuals or organizations after the passage of time, appearing as devastating in nearly a phase-like manner. Crises that function as processes simply begin as unnoticed issues that accumulate over time into larger issues, which eventually result in collapse on either individual or organizational levels.

Examination of crises and crisis management literature helps to better one's understanding of the onsets 2007-08 financial crisis, and the 2019-20 COVID health crisis. With respect to Williams et al.'s (2017) literature, characteristics of a crisis as an event align with the recession of the 2000s, while traits of a crisis occurring as a process align with the COVID pandemic. Since the financial crisis had distinguishable origins, such as the housing dilemma, fall of Lehman, and other major issues on the institutional levels of banking, we can infer that it was a pivotal event on both individual and organizational levels. On the other hand, since the COVID crisis' aftermath and impacts followed after its initial onset and led to large scaled losses for individuals and institutions, it can be argued to be a crisis occurring as a process in reference to Williams et al.'s literature (2017).

## **V. How Various Economic Crises Impact Payment Behavior**

### **a. 2007-08 Financial Crisis and Payment Behavior**

Just as physical behaviors of human beings change in times of adversity, payment behaviors of consumers also change in response to shocks to the economy. With respect to the 2007-08 financial crisis, an empirical study on financial practices from January 2005 through December 2010 uncovered that after the financial crisis, budgeting, spending, and saving all increased significantly, compared to pre-crisis times (O'Neill & Xiao 2012). Since the start of the 2000s, the trajectory of big investment banks becoming heavily securitized hinted at inherent economic decline ahead. Credit/loan default, poor risk management, alongside the housing bubble, were increasingly problematic occurrences as the 2000s progressed.

After the 2007-08 crisis hit, people became more risk averse than they were in the earlier years of the 2000s. With unemployment soaring and financial intermediaries falling through the cracks, individuals were found to be more conservative with consumption, and increasing their savings. O'Neill and Xiao share that in December of 2007, 62% of Americans reduced their spending since the onset of the recession, and 48% of Americans admitted to being in more unfavorable financial shape after 2007-08.

Pre-financial crisis, the following stats held true:

- 88% pay bills on time, 67% balance their checkbook monthly,
- 53% spread their money across several types of investments, 49% save or invest money out of each paycheck, and pay credit cards in full monthly

With respect to payment methods used in the 2008 timeframe, Foster et al. (2010) share that consumers made 52.9 percent of their monthly payments with a payment card, and a higher number of consumers had debit cards, compared to credit cards. Consumer payment behavior shifts in cases of financially-related economic decline are also quite heavily impacted by the

level of savings present within a household. The more a household has in savings, the more likely they are to have emergency funds, retirement plans, and lower debt and ability to pay off balances.

In 2009, the economy was re-emerging after the worst of the financial crisis. Cash and money orders were beginning to be used more frequently in the period after the crisis, and the use of payment cards fell by 13.2, with electronic payments dropping by 15.1 percent (Foster et al. 2011). Both supply side and demand-related shifts for card issuance have been attributed to the contraction of credit usage during recessionary periods. This transition is especially interesting, as it occurred despite the growth of usage in electronic payment methods that had been consistently increasing with the decade leading up to the crisis. The overall share of non-cash instruments used in consumer payment endeavors fell by 7.4 percentage points from 79.2 percent in 2008, to 71.8 percent in 2009 (Foster et al. 2011).

Herbst-Murphy (2015) shares that beginning in 2012, the BLS indicated that there were signs of recovery from the aftermath of the financial crisis, and consumer confidence in spending was rekindling. A primary marker of recovery from the 2007-08 recession was a resurgence of credit usage after years of cash dominant transactions by consumers. Credit card payments increased, with debit card usage also increasing and following nearly the same trajectory of growth (Herbst-Murphy 2015). Data shows that cash and checks were being substituted by debit cards, and when individuals were able to spend with more ease again, they could carry out larger transactions, which people typically place on credit cards so that balances can be paid off in installments over time (Herbst-Murphy 2015).

In a paper written in the later end of the financial crisis, Hartmann discusses the various gender-based implications that financial crisis had on labor outcomes (2009). Hartmann

mentions that the male labor force participation rate falling during the financial crisis period was due to men being more apt to work in sectors of the labor force that are more heavily affected by aggregate economic activity (2009). This would mean that business cycle fluctuations, which inevitably are impacted by financial crises, would be one reason as to why male labor force participation dropped during the 2007-08 period. Women held jobs in more “stable” sectors of the economy, such as in education or healthcare, which allowed for them to not have as much of a shock to employment statuses during the financial crisis (Hartmann 2009).

b. 2019-2020 COVID-19 Health Crisis and Payment Behavior

Different from the more forecastable financial crisis of 2007-08, the COVID-19 pandemic shaped consumer payment behavior due to health-related precautionary measures. Huterska et al. (2021) share that social distancing protocols, and altered retail and service interactions, led to a higher share of individuals switching to more contactless, or cashless payment methods. Although contactless payment methods were a result of fears around COVID-19 transmission, cash payments were not losing popularity within certain demographic groups of consumers (i.e. age, or education level). Huterska et al. shed light on the fact that in the short term, consumer payment habits are difficult to change significantly, and moving away from cash-based payments requires consumers to part from patterns and habits they’ve created throughout their lifetime. Other deciding factors, aside from personal convictions and pandemic-related fears, that pushed individuals more toward cashless payment were the ease of use, levels of associated costs, speed and security, and lastly, convenience (Huterska et al. 2021).

Foster et al. (2021) share that in 2020, of the average 68 payments individuals made during a month, debit cards were used most often, followed by credit cards, leaving cash-based spending to be the least of the three most frequently used payment methods. The aforementioned

values and findings had not changed from where they stood in 2019. The propensity of a consumer making an online payment increased by 7% between 2019 and 2020 (Foster et al. 2021). Notably, mobile payments made between October 2019 and October 2020 went up from 8%, to 46%, which indicates how the pandemic moved many consumers toward more electronically-dependent payment means (Foster et al. 2021).

The COVID crisis disproportionately impacted the finances of low income and minority backgrounds, and those who had face-to-face service jobs impacted by pandemic-related restrictions (Kubota et al. 2021). Economic impact payments, commonly referred to as stimulus checks, were released to several households during the heart of the pandemic, which increased consumers' cash liquidity and resulted in higher cash spending trends from the time of payment receipt, to about a month after (Kubota et al. 2021). Card payments were not as frequently used as the lowered ability to consume, save, and tend to debts made several individuals question their ability to pay any card debt back in a timely manner. Kubota et al. share that with respect to stimulus payments, those who had binding credit constraints spent about 59% of their relief payments toward paying off balances alone.

Greene et al. (2021) remind individuals that certainty on the trajectory of sustained, increased cashless payment adoption is still unable to be declared, as a large duration of time since the offset of the pandemic has not yet passed. From a more socioeconomic perspective, Hashem (2020) states that the purchase behavior of individuals is bound to the values and traditions of their societies. The aforementioned implies that throughout the pandemic, a lot of individuals may have stuck to, or will continue to stick to, their traditional methods of payment, while some individuals may have noticed more and more of those around them using electronic payments frequently, and ended up mirroring the payment behaviors of their counterparts.



Transfer/person to person payments (electronically sharing money from one person to another) via apps like PayPal, Venmo, and Zelle were on the rise during the COVID-19 pandemic (Greene et al. 2021). Those working from home throughout the pandemic had higher amounts of their consumption accumulating through online or mobile payment methods, while those with part or full-time employment in-person would have a higher likelihood to use cash for payments in stores (Greene et al. 2021). In the 2020 Diary of Consumer Payment Choice, Greene and Stavins mention that in comparison to 2019 values, there was an increased volume of shares associated with usage of cards and electronic instruments, while volume shares of paper instrument usage declined. Consequently, the total value of cashless payments had risen. Relative to overall payments in 2020, debit (28%) and credit card payments (27%) were nearly equal in value, while cash lagged as a payment method (19%) (Greene & Stavins 2021).

In a research paper published by the Atlanta Fed, an analysis was done on cash holdings during the COVID-19 pandemic. Survey of Consumer Payment Choice data was utilized in the analysis of currency in circulation from the fall of 2019, to the summer of 2020. Foster & Greene (2021) share that the likelihood of individuals using cash between the fall of 2019 and the spring of 2020 did not change, however, consumers did have an overall higher holding of cash in 2020. Cash holding was found to be higher for a variety of reasons, but the most direct contributors to rises in cash acquisition were the prevalence of unemployment benefits, and economic relief/stimulus payments being distributed in the late spring and summer of 2020 (Foster & Greene 2021). Currency in circulation increased by 9.3% between April 2019 and April 2020, and vault cash in financial institutions also increased upwards of 14% in March and April of 2020 (Foster & Greene 2021). The aforementioned indicates that financial institutions and depository entities in the banking industry were accounting for a rise in cash demand due to the

COVID health crisis, as uncertain economic conditions were speculated to occur. This speculation may be due to past crises resulting in individuals making large withdrawals from their bank accounts, out of panic.

## **VI. Consumer Behavior Changes Due to Financial vs. Health Crisis, Respectively**

### **a. Financial Crisis: Gender-Based Consumer Behavior Shifts**

The 2007-08 financial crisis was one which was more foreseeable than the global health crisis of COVID-19. For this reason, individuals were more likely to plan out ways to lessen the personal impact of economic downturn in the 2007-2008 period, than in the 2019-2020 pandemic crisis. It was found that in 2006, which was a year before any sign or declaration of economic collapse was brought forward, an online data collecting quiz on a few fundamental financial practices revealed that older respondents and males had higher quiz values for having a financial plan, taking into account possible savings, investments, purchases, and budget restraints, than did females (O'Neill & Xiao 2012).

In terms of unemployment, what sets the financial crisis apart from the COVID health crisis is how blue collared jobs, which were predominantly held by men, were more at stake than women's jobs, which tend to be more on the pink and white collar side. Blue collared jobs most commonly allude to construction work, mechanical operations, or manufacturing. Young men, specifically those aged 15-24, were disproportionately affected by the financial crisis (Verick 2009). The financial crisis was responsible for diminishing the amount of jobs present within the economy, which made the odds of seeking out employment successfully, very slim. Since the prime employee would be an individual who has a lot of skill, education, and experience, young men who had not yet been able to reach career or educational heights were left behind in the labor market (Verick 2009). Many jobs within the economy have ties with production and

manual labor, which are typically jobs filled by men. With a reduction in overall employment opportunities as a whole, men ended up being the most impacted by the financial crisis, with young women following after (Verick 2009). For this reason, the 2007-08 period was given the title of the “Great Mancession,” by many labor economists.

The Bureau of Labor Statistics elaborates on labor trends during the financial crisis period. A 2011 BLS review revealed that from December 2007 to June 2009 crisis, the jobs with the largest percentage declines in employment were in the industries of construction (-19.8%), durable goods manufacturing (-17.5%), and private non-farm goods production (-16.2%) (Goodman & Mance 2011). The aforementioned industries fall under the blue collared job category. A publication from the Federal Reserve Bank of St. Louis further explained how from the last quarter of 2007, to the first quarter of 2009, about 78 percent job losses were attributed to men (Wall 2009). The unemployment rate rose significantly higher for men than for women between 2007-2009, with male rates rising from 4.9 percent to 8.9 percent, while women's rose from 4.7 percent to 7.2 percent (Wall 2009).

The factor of risk tolerance discrepancies between men and women played an important role in how both genders' payment choices may have followed in the 2007-2008 crisis. Eckel (2008) reminds us that alongside gender, age is a very important indicator of how much risk one is willing to take with their finances. Men were found to be more risk tolerant than women across the board (Eckel 2008), which may indicate that even despite fluctuations in employment and subsequently, income levels, men may be more likely to deviate from the liquidity-creating cash trends during the time of the crises, and continue to use payment methods like debit and card payments despite potential risks with repayment.

#### b. COVID Crisis: Gender-Based Consumer Behavior Shifts

Research indicates that the COVID-19 pandemic exacerbated the issue of the gender wage gap and employment. Dang and Nguyen (2021) share that women are more likely to drop consumption and increase saving during crises relative to health. It is also made conspicuous that especially so for women, times of high unemployment indicate heavy income-related losses for them (Dang & Nguyen 2021). Since a large portion of women happen to fill part-time positions to balance household obligations, it is shown that women are 24% percent more likely to experience permanent job loss than men, in light of COVID. The net effect on women's employment trends was a substantially lowered female labor participation rate, and even more so in underdeveloped countries (Dang & Nguyen 2021).

Alon et al. (2020) cite that COVID-19 has caused women specifically to face challenges with sustaining income flow and employment. The pandemic heavily impacted jobs predominantly held by women, such as restaurant or hospitality jobs. Employment losses for women were not only connected to the closure of places offering service-related jobs. The higher likelihood of women having to become full-time caregivers due to daycare and school closures was extremely high, which impacted their acquisition or sustenance of a job in the market (Alon et al. 2020). Marital status or child-related needs that may exist in a woman's life, limited which work opportunities women were able to keep or forfeit at the onset of COVID. A woman's ability to seek out employment during the pandemic was dependent on the division of labor within the household that they were a part of, and if gender norms for women (as caretakers) were heavily enforced in their lives. A 2020 Bureau of Statistics survey suggested that the most impacted areas of employment with sustained downward trends for all months in 2020 were those of leisure and hospitality, retail and wholesale trade, and management services, which are

mostly white and pink-collared jobs (Dalton 2020). For women, these areas of employment were heavily impacted by quarantine and lockdown protocols, and the rise of remote services.

Particularly in terms of demographics, in low and middle income countries, there was an employment decline of 4.7 percent for women, compared to a 3.3 percent decline for men during the COVID crisis (Kenny & Yang 2021). Kenny and Yang share that there was a disproportionate effect of COVID-19 closures on sectors dominated by a higher percentage of women than men in the workforce, that also coincided with a lack of childcare options to help during the pandemic (2021). Due to women having lessened flow of income in cases where their employment was heavily challenged by the unforeseen pandemic, their consumption choices would differ from those of men, who were challenged to a lesser degree by the direct onset of COVID.

The types of employment held by women during COVID are important to note. Farré et al. (2022) share how the global pandemic resulted in a significant increase in the gender gap, with respect to the total hours worked by women, including both paid and unpaid (household-based) work. The domestic workload of women was found to increase immensely due to lockdowns, closure of educational and childcare centers, and domestic services (Farré et al. 2022). A higher domestic workload equates to more of women's working hours occurring out of the market. The drastic change to women's domestic workloads occurred regardless of their labor market-related situations, further emphasizing the roles of household gender norms being more directly and involuntarily implemented during health and well-being based crises. When considering women and their payment choices, it can be hypothesized that due to a deficit in wages and income bases, more credit or card payments may be made by women, to compensate

for any unavailable monetary balances. Transfer payments from loved ones may be more likely to be received by women, to fulfill familial needs during health-related crises.

## **CHAPTER 3 DATA OVERVIEW**

### **I. Introduction**

Using data from Atlanta Fed's *Survey of Consumer Payment Choice*, regressions will be performed, through the statistical analysis software, STATA, to observe the relationship between gender and payment choice among consumers. Analysis of gender and payment choice trends during 2007-08 will occur for the financial crisis, and 2019-2020 for the COVID health crises will be the focus of this paper. The Survey of Consumer Payment Choice observes nine payment instruments, while not collecting responses on individuals' assessments of the characteristics they find to be noteworthy about money orders, and traveler's checks. For this paper, payment choice will be measured through observations on adoption and usage trends for the three payment instruments of checks, debit, and credit. Observation of statistical data from the years of 2008, 2012, 2019, and 2020 will occur, to see if there are any discernible changes in consumer payment choices in years of, and shortly after, each respective crisis.

The regression model utilized in this paper will be the standard, Ordinary Least Squares (OLS). The OLS model's linear regression style provides valuable information on estimating coefficient values, describing the relationship between independent, running variables and a dependent variable. Since the SCPC ascertains the two main categories of payment method utilization being adoption and use, separate OLS regressions will be performed for adoption and use for the payment methods of checks, debit, and credit cards for each year in question. Payment data analyzed through OLS regressions would provide valuable information on consumer payment choices in the present moment, and then over time, creating more knowledge on prevailing payment preferences within the population during crises.

The first step of payment use is adoption, which looks at the types of payment accounts and methods that have sustained patterns of usage throughout the year. The adoption, or lack thereof, of certain payment modes ties to factors such as how easy it is to use the method, how convenient it is in carry out transactions, or if the payment type is accepted or accessible in certain retail or private points of sale. The second step of configuring the use of a payment method represents the propensity of a certain payment method gaining momentum in transactions in the future, or for short periods of time, instead of regularly. Regression models, like the OLS, take into account the varying characteristics of each payment method. OLS looks into survey respondents' frequency of use of various payment methods, and which types of transactions they may be more apt to use certain payment instruments for (i.e. revolving payments, casual spending, etc.). A two-step regression analysis would help to fill any gaps in information on consumer payment choices. Two-step models, such as that of adoption and use, minimize the amount of bias in payment behavior measures with the inclusion of both objective, administrative data, and more subjective, complementary data from self-reported surveys. A combination of objective and subjective data is resourceful in making estimations of consumer payment behavior.

## II. Variables and Regression Models

- (1)  $x_{ijt} = \beta_1 \text{Gender}_{it} + \beta_2 \text{Age}_{it} + \beta_3 \text{Non-white}_{it} + \beta_4 \text{EmploymentStatus}_{it} + \beta_5 \text{IncomeLevel}_{it} + \beta_6 \text{MaritalStatus}_{it} + \beta_7 \text{EducationLevel}_{it} + \beta_8 \text{DemographicLocation}_{it} + \beta_9 \log(\text{PymtConvenience})_{it} + \beta_{10} \log(\text{PymtCost})_{it} + \beta_{11} \log(\text{PymtAcceptance})_{it} + \beta_{12} \log(\text{PymtSetup})_{it} + \beta_{13} \log(\text{PymtSecurity})_{it} + \beta_{14} \log(\text{PymtSpeed})_{it} + \beta_{15} \log(\text{PymtCtrl})_{it}$
- (2)  $y_{ijt} = \beta_1 \text{Gender}_{it} + \beta_2 \text{Age}_{it} + \beta_3 \text{Non-white}_{it} + \beta_4 \text{EmploymentStatus}_{it} + \beta_5 \text{IncomeLevel}_{it} + \beta_6 \text{MaritalStatus}_{it} + \beta_7 \text{EducationLevel}_{it} + \beta_8 \text{DemographicLocation}_{it} + \beta_9 \log(\text{PymtConvenience})_{it} + \beta_{10} \log(\text{PymtCost})_{it} + \beta_{11} \log(\text{PymtAcceptance})_{it} + \beta_{12} \log(\text{PymtSetup})_{it} + \beta_{13} \log(\text{PymtSecurity})_{it} + \beta_{14} \log(\text{PymtSpeed})_{it} + \beta_{15} \log(\text{PymtCtrl})_{it}$



Equation 1 above represents the regression model utilized to observe adoption of various payment methods. Adoption is represented as “ $x_{ijt}$ ” in this model, with consumer  $i$  of instrument  $j$  during period  $t$ . The remainder of equation 1 contains explanatory variables acting as a set of interaction terms to measure adoption of the payment instruments of checks, debit, and credit, over time.  $\beta_9$  to  $\beta_{15}$  take the log of each assessment characteristic of the payment instruments in question, to measure how each payment method is perceived relative to the base instrument of cash. Equation 2 mirrors the dynamics and function of Equation 1, with the key difference being that “ $y_{ijt}$ ” represents the use of payment instruments, instead of adoption.

Several running variables are to be observed alongside payment instrument adoption and use, as the inclusion of more running variables increase the variance of the data, and minimize bias. For this paper, which looks for a relationship between both genders and their respective impacts on payment behavior during crises, variables such as income, age, educational attainment levels, geographical location, and race would be of importance. These variables are included, to observe if any significant effects from year to year exist, in conjunction with gender on payment adoption and use.

Employment and/or labor force status would be another important variable to apply in each OLS regression, as employment trends during both the financial and COVID crises tell a story of one's quality of life, and the amount of income one may have for spending. Income levels, on both individual and household levels, would indicate which payment methods individuals would be more likely to use on regular bases. In times of crisis, it is integral to look for deviations from regular payment choices, signs of long-term adoption of payment methods for their functional practicality, or usage trends associated with payment methods that may, at some point in the future, become more likely to be used regularly.

For my topic's regressions, a few variables had to be manually created, in addition to pre-existing data from the SCPC. For each assessment characteristic (acceptance, cost, convenience of a payment instrument, etc.), variables for each level of assessment were scaled relative to their share in usage of cash, as a base. This would allow for a more accurate observation of adoption and use, as cash is the base unit of account from which various other payment methods stem from. A non-white variable was also created, to capture more robust demographic differentiation among consumers, and how that may, in some cases, play into payment choices and decisions. The nonwhite variable was binary and equal to 0, and was based off of the preexisting "white" variable created by the SCPC.

OLS regressions present us with observable estimations of changes in adoption and use values. For each of the three payment methods in question, which are checks, debit, and credit, two separate OLS regressions are carried out. The dependent variable for the first regression for each method is adoption, while in the second regression, the dependent variable is the use (also called the "share" variable for 2008 and 2012). The main explanatory variables for the OLS regression are gender (female and male), income, education, employment, race (described through the binary, nonwhite variable), marital status, and census division (a locational demographic variable). Following the explanatory, running variables in the regression, we include multiple assessment characteristics of payments methods, such as cost, security, setup, convenience, and acceptance. Schuh and Stavins (2011) share that setup and record keeping are most relevant characteristics in explaining adoption, whereas security is the assessment characteristic that holds greatest importance in explaining use for transactions. The aforementioned provides insight on what general trends to look out for, in terms of assessment variables, in the results for each year of data. The explanatory and assessment variables used in

the first step mirror those used in the second step. Special attention will be paid to the coefficient and p-values of each independent variable. If the p-value indicates statistical significance relative to the dependent variable, which would be either adoption or use/share of a payment method, then we can go on to look at the coefficient value to see the percentage by which the explanatory variables impact the dependent variable. Standard errors are clustered at three levels: \*\*\*p<0.01; \*\*p<0.05; \*p<0.1.

### III. Descriptive Statistics

Descriptive statistics help to describe the samples in question through basic mathematical interpretations of variables. Unlike regression results, descriptive summary statistics are preliminary intuitions on the data. In this section, the summary statistics for 2008, 2012, 2019, and 2020 are included, with brief interpretations on mean values following.

Table 1A: 2008 Check Adoption Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_acnt_adopt	1002	.969	.173	0	1
male	1010	.438	.496	0	1
age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
chk_cost2	997	-.184	.315	-1.609	1.609
chk_speed2	997	-.489	.443	-1.609	1.609
chk_setup2	996	-.131	.387	-1.609	1.609
chk_security2	999	.292	.709	-1.609	1.609
chk_ctrl2	997	-.179	.61	-1.609	1.609
chk_record2	998	.746	.577	-1.609	1.609
chk_accept2	993	-.202	.385	-1.609	1.609

Table 1B: 2008 Check Use Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_sh	985	.164	.165	0	1
male	1010	.438	.496	0	1
Age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
chk_cost2	997	-.184	.315	-1.609	1.609
chk_speed2	997	-.489	.443	-1.609	1.609
chk_setup2	996	-.131	.387	-1.609	1.609
chk_security2	999	.292	.709	-1.609	1.609
chk_ctrl2	997	-.179	.61	-1.609	1.609
chk_record2	998	.746	.577	-1.609	1.609
chk_accept2	993	-.202	.385	-1.609	1.609

Tables 1A and 1B represent the summary statistics for the 2008 survey sample, with respect to check adoption and use. With respect to gender, we can see from both tables, that 43.8% respondents are male, and 56.2% are female for 2008. The findings for the explanatory variables in the model can be impacted by a more female-skewed pool of survey respondents. The average age of respondents was 49, with only 11.6% of all respondents being nonwhite. Slightly more observations were collected for check adoption, than for check use, which may marginally impact how the significance of either adoption and use may come out to be, once regressed. For both check adoption and use, we can see that the assessment characteristics of security and record keeping had the highest and positive ratings.

**Table 1C: 2008 Debit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_adopt	1002	.825	.38	0	1
male	1010	.438	.496	0	1
age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
dc_cost2	997	-.166	.355	-1.609	1.609
dc_speed2	996	-.054	.347	-1.609	1.609
dc_setup2	996	-.103	.408	-1.609	1.609
dc_security2	999	.276	.81	-1.609	1.609
dc_ctrl2	997	-.051	.575	-1.609	1.609
dc_record2	999	.682	.637	-1.609	1.609
dc_accept2	993	-.184	.397	-1.609	1.386

**Table 1D: 2008 Debit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_sh	986	.266	.259	0	.935
male	1010	.438	.496	0	1
age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
dc_cost2	997	-.166	.355	-1.609	1.609
dc_speed2	996	-.054	.347	-1.609	1.609
dc_setup2	996	-.103	.408	-1.609	1.609
dc_security2	999	.276	.81	-1.609	1.609
dc_ctrl2	997	-.051	.575	-1.609	1.609
dc_record2	999	.682	.637	-1.609	1.609
dc_accept2	993	-.184	.397	-1.609	1.386

Tables 1C and 1D look into the descriptive statistics for debit adoption and use, respectively. In terms of debit adoption, we can observe that 82.5% of survey respondents had already adopted debit in some amount, while the remaining 17.5% of respondents did not have any ongoing, long term debit adopted. In terms of debit use, 26.6% of all transactions made within a month, in 2008, were made through debit alone, relative to any other payment instruments individuals had at their disposal.

**Table 1E: 2008 Credit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_adopt	1001	.875	.331	0	1
male	1010	.438	.496	0	1
age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
cc_cost2	997	-.563	.591	-1.609	1.609
cc_speed2	997	-.052	.352	-1.609	1.609
cc_setup2	995	-.144	.474	-1.609	1.609
cc_security2	997	.318	.891	-1.609	1.609
cc_ctrl2	998	-.041	.662	-1.609	1.609
cc_record2	999	.79	.608	-1.609	1.609
cc_accept2	993	-.581	.59	-1.609	1.386

**Table 1F: 2008 Credit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_sh	989	.238	.247	0	.924
male	1010	.438	.496	0	1
age	1009	48.671	14.146	16	85
nonwhite	1010	.116	.32	0	1
lf_emp	989	.706	.456	0	1
married	1010	.653	.476	0	1
edu_lhs	1010	.02	.139	0	1
edu_hs	1010	.142	.349	0	1
edu_sc	1010	.338	.473	0	1
edu_c	1010	.28	.449	0	1
inc_u25	1007	.112	.316	0	1
inc_2549	1007	.224	.417	0	1
inc_5074	1007	.211	.408	0	1
inc_7599	1007	.209	.406	0	1
inc_100124	1007	.108	.311	0	1
inc_o125	1007	.13	.337	0	1
statereside	1010	25.216	14.255	2	49
cc_cost2	997	-.563	.591	-1.609	1.609
cc_cost2	997	-.052	.352	-1.609	1.609
cc_setup2	995	-.144	.474	-1.609	1.609
cc_security2	997	.318	.891	-1.609	1.609
cc_ctrl2	998	-.041	.662	-1.609	1.609
cc_record2	999	.79	.608	-1.609	1.609
cc_accept2	993	-.581	.59	-1.609	1.386

Nearly mirroring the summary statistics for 2008 debit adoption and use, pre-existing credit adoption among consumers was at 87.5%. Record keeping and security remained as highly rated attributes of credit adoption and use, but were slightly higher for credit, than for checks and debit.

**Table 2A: 2012 Check Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_adopt	2031	.913	.281	0	1
male	2065	.436	.496	0	1
female	2065	.564	.496	0	1
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
chk_accept2	2047	-.309	.396	-1.609	1.609
chk_cost2	2050	.076	.264	0	1
chk_convenience2	2048	.22	.414	0	1
chk_secure2	2050	.26	.666	-1.609	1.609
chk_setup2	2054	.079	.27	0	1

**Table 2B: 2012 Check Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_sh	1974	.112	.143	0	1
gender	2065	1.564	.496	1	2
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
chk_accept2	2047	-.309	.396	-1.609	1.609
chk_cost2	2050	.076	.264	0	1
chk_convenience2	2048	.22	.414	0	1
chk_secure2	2050	.26	.666	-1.609	1.609
chk_setup2	2054	.079	.27	0	1

In Tables 2A and 2B, it is displayed that check adoption among respondents averaged to be 91.3%, implying that checks were highly likely to have been acquired and used over a long period of time leading up to, and through, 2012. Check use, which is more pertinent to routine utilization, shows that only 11.2% of monthly transactions were made by using checks. Although checks were represented as being adopted with a higher percentage, 88.8% of all other transactions being made by consumers throughout a month were through payment instruments not including checks. The average age of respondents for 2012 displays as being 51, with only

14.5% of respondents being classified as nonwhite, pertinent to race. Convenience and security of checks were rated the most highly, in terms of assessment characteristics.

**Table 2C: 2012 Debit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_adopt	2031	.803	.398	0	1
male	2065	.436	.496	0	1
female	2065	.564	.496	0	1
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
dc_accept2	2046	-.049	.323	-1.609	1.609
dc_cost2	2046	.067	.25	0	1
dc_convenience2	2048	.032	.175	0	1
dc_secure2	2050	.271	.779	-1.609	1.609
dc_setup2	2052	.049	.215	0	1

**Table 2D: 2012 Debit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_sh	1974	.273	.271	0	1
male	2065	.436	.496	0	1
female	2065	.564	.496	0	1
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
dc_accept2	2046	-.049	.323	-1.609	1.609
dc_cost2	2046	.067	.25	0	1
dc_convenience2	2048	.032	.175	0	1
dc_secure2	2050	.271	.779	-1.609	1.609
dc_setup2	2052	.049	.215	0	1

As represented in Tables 2C and 2D, the proportion of respondents adopting versus using debit cards is similar to that of checks. 80.3% respondents adopted some amount of debit cards, prior to, and throughout, 2012. On the other hand, debit use was a bit higher than check use, standing at 27.3%. As per the means displayed in both tables, the security levels of debit cards for both adoption and use were rated the highest and most significantly. Debit use had slightly



less observations collected for it, compared to debit adoption. Debit adoption and use trends in 2012 were very similar to those of 2008, therefore, significant changes were not found to have existed or cultivated between both years.

**Table 2E: 2012 Credit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_adopt	2030	.798	.402	0	1
male	2065	.436	.496	0	1
female	2065	.564	.496	0	1
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
cc_accept2	2047	-.002	.297	-1.609	1.609
cc_cost2	2048	.277	.448	0	1
cc_convenience2	2047	.017	.128	0	1
cc_secure2	2050	.333	.819	-1.609	1.609
cc_setup2	2052	.114	.317	0	1

**Table 2F: 2012 Credit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_sh	1974	.215	.251	0	1
male	2065	.436	.496	0	1
female	2065	.564	.496	0	1
age	2065	51.425	15.133	20	93
nonwhite	2065	.145	.352	0	1
working_now	2065	.615	.487	0	1
edu_lhs	2065	.027	.162	0	1
edu_hs	2065	.159	.366	0	1
edu_sc	2065	.368	.482	0	1
edu_c	2065	.252	.434	0	1
edu_pgs	2065	.194	.395	0	1
inc_lt25	2062	.17	.376	0	1
inc_2549	2062	.247	.431	0	1
inc_5074	2062	.216	.411	0	1
inc_7599	2062	.145	.353	0	1
inc_gt125	2062	.125	.331	0	1
inc_gt200	2062	.035	.185	0	1
statereside	2065	24.957	14.789	1	51
cc_accept2	2047	-.002	.297	-1.609	1.609
cc_cost2	2048	.277	.448	0	1
cc_convenience2	2047	.017	.128	0	1
cc_secure2	2050	.333	.819	-1.609	1.609
cc_setup2	2052	.114	.317	0	1

Tables 2E and 2F represent 2012 credit adoption and use. Relative to 2008, a year which was situated in the midst of the financial crisis, average adoption of credit by consumers fell by 7.7% by 2012. A drop of 2.3% existed in credit use, between 2008 and 2012. The aforementioned information represents how adoption of credit fell more significantly than more

casual use of credit for monthly expenditures. Security and reasonable costs had the highest average turnover rates, as being notable attributes of credit, for both adoption and use.

**Table 3A: 2019 Check Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_acnt_adopt	3359	.92	.272	0	1
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
chk_accept2	3364	-.347	.446	-1.609	1.609
chk_convenience2	3362	-.273	.474	-1.609	1.609
chk_cost2	3360	-.122	.289	-1.609	1.609
chk_secure2	3359	.212	.651	-1.609	1.609
chk_setup2	3361	-.13	.356	-1.609	1.609

**Table 3B: 2019 Check Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_typ	2238	3.67	6.368	0	55.348
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
chk_accept2	3364	-.347	.446	-1.609	1.609
chk_convenience2	3362	-.273	.474	-1.609	1.609
chk_cost2	3360	-.122	.289	-1.609	1.609
chk_secure2	3359	.212	.651	-1.609	1.609
chk_setup2	3361	-.13	.356	-1.609	1.609

Tables 3A and 3B show that for 2019, the respondent pool was 43.2% male, and 56.8% female. A larger portion of respondents being female may have slight implications on the empirical results for this year. By 2019, 92% respondents had adopted a checking account by which they would be able to utilize checks. When looking at the check use statistics, the typical amount of check payments made in 2019 were about 4 within a month. The average age of respondents for 2019 was 53 years old. More supplemental information on 2019 data can be provided, based on values shown in Tables 3A and 3B. The average income level of respondents was \$40,000 to \$49,999, given that the SCPC codebook for 2019 outlined the mean value (~11) for variable ‘hhincome’ to be assigned to that income bracket. Similarly, education with a mean

value of ~11 was indicative of an average educational attainment level of respondents being at the associate's degree level, as per the SCPC codebook (Foster 2020).

**Table 3C: 2019 Debit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_adopt	3307	.812	.391	0	1
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
dc_accept2	3365	.015	.336	-1.609	1.609
dc_convenience2	3360	.106	.428	-1.609	1.609
dc_cost2	3364	-.064	.301	-1.609	1.609
dc_secure2	3357	.226	.789	-1.609	1.609
dc_setup2	3360	-.032	.385	-1.609	1.609

**Table 3D: 2019 Debit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_typ	2238	21.723	30.751	0	221.973
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
dc_accept2	3365	.015	.336	-1.609	1.609
dc_convenience2	3360	.106	.428	-1.609	1.609
dc_cost2	3364	-.064	.301	-1.609	1.609
dc_secure2	3357	.226	.789	-1.609	1.609
dc_setup2	3360	-.032	.385	-1.609	1.609

Values for debit adoption and use in Tables 3C and 3D indicate that 81.2% of survey respondents in 2019 adopted debit in some capacity, to use regularly. In terms of debit use, about 22 of all transactions made within a month were carried out, using debit as the payment instrument. Of a maximum amount of monthly transactions equating to about 222, 22 transactions would be about 10% utilization of debit in a month, relative to any other payment instruments being used by respondents. Security and convenience were rated the highest as favorable attributes contributing to debit adoption and use.

**Table 3E: 2019 Credit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_adopt	3359	.799	.401	0	1
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
cc_accept2	3366	.038	.327	-1.609	1.609
cc_convenience2	3359	.127	.432	-1.609	1.609
cc_cost2	3365	-.421	.547	-1.609	1.609
cc_secure2	3357	.324	.829	-1.609	1.609
cc_setup2	3362	-.09	.454	-1.609	1.609

**Table 3F: 2019 Credit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_typ	2238	17.629	27.707	0	192.491
female	3372	.568	.495	0	1
age	3372	52.767	15.312	18	109
hhincome	3369	11.194	4.009	1	16
education	3372	11.169	2.267	1	16
working	3369	.581	.493	0	1
nonwhite	3372	.124	.33	0	1
census_division	3370	4.848	2.27	1	9
maritalstatus	3371	2.572	2.016	1	6
cc_accept2	3366	.038	.327	-1.609	1.609
cc_convenience2	3359	.127	.432	-1.609	1.609
cc_cost2	3365	-.421	.547	-1.609	1.609
cc_secure2	3357	.324	.829	-1.609	1.609
cc_setup2	3362	-.09	.454	-1.609	1.609

Table 3E shows that 79.9% of respondents had a credit card in use either before or throughout 2019. When considering mean values in Table 3F, the value for credit use indicates that with a maximum number of transactions within a month being 192, about 18 transactions were made, using credit. The aforementioned would amount to a 9.4% utilization of credit for monthly transactions, relative to all other payment instruments individuals may also have in use.

**Table 4A: 2020 Check Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_acnt_adopt	1894	.929	.257	0	1
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
chk_accept2	1897	-.335	.463	-1.609	1.609
chk_convenience2	1894	-.269	.478	-1.609	1.609
chk_cost2	1898	-.122	.288	-1.609	1.609
chk_secure2	1897	.172	.664	-1.609	1.609
chk_setup2	1898	-.135	.364	-1.609	1.609

**Table 4B: 2020 Check Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
chk_typ	1909	3.424	6.776	0	61.348
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
chk_accept2	1897	-.335	.463	-1.609	1.609
chk_convenience2	1894	-.269	.478	-1.609	1.609
chk_cost2	1898	-.122	.288	-1.609	1.609
chk_secure2	1897	.172	.664	-1.609	1.609
chk_setup2	1898	-.135	.364	-1.609	1.609

Table 4A shows us that of all respondents, 92.9% had adopted checking accounts they were able to utilize for checks by 2020. All 2020 descriptive statistics show us that the average age of survey respondents was 52 years of age. Additionally, 2020 summarize data displays there to be 57.5% respondents being female, with 42.5% being male. Income levels (mean of ~11) were averaging about \$40-49,000 a year, and educational attainment levels (also having a mean of ~11) averaged to be at an associate's degree level, as referenced in the 2020 SCPC codebook (Foster 2021). Table 4B shares that if a monthly, 61 transactions were made, only 3 would be fulfilled by check usage. In 2020, checks are used as a payment method, mostly for their assessment characteristic of being secure, which is warranted given the ongoing pandemic.

**Table 4C: 2020 Debit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_adopt	1868	.833	.373	0	1
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
dc_accept2	1897	.071	.336	-1.609	1.609
dc_convenience2	1893	.162	.427	-1.609	1.609
dc_cost2	1899	-.058	.282	-1.609	1.609
dc_secure2	1898	.209	.785	-1.609	1.609
dc_setup2	1897	-.029	.376	-1.609	1.609

**Table 4D: 2020 Debit Use Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
dc_ttyp	1909	23.335	33.225	0	240.366
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
dc_accept2	1897	.071	.336	-1.609	1.609
dc_convenience2	1893	.162	.427	-1.609	1.609
dc_cost2	1899	-.058	.282	-1.609	1.609
dc_secure2	1898	.209	.785	-1.609	1.609
dc_setup2	1897	-.029	.376	-1.609	1.609

Table 4C indicates that 83.3% of all respondents have adopted some form and amount of debit, to carry out transactions. From 2019, debit adoption has increased about 2%, showing a marginal, yet positive movement in debit adoption between the start to the peak of the COVID crisis. In terms of debit use, Table 4D shows that of a possible 240 transactions that could be made within a month, 23 of them were carried out, using debit. That makes about 9.6% of monthly transactions, completed through debit use.

**Table 4E: 2020 Credit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_adopt	1891	.796	.403	0	1
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
cc_accept2	1896	.086	.34	-1.609	1.609
cc_convenience2	1890	.18	.449	-1.609	1.609
cc_cost2	1895	-.423	.55	-1.609	1.609
cc_secure2	1895	.297	.818	-1.609	1.609
cc_setup2	1896	-.09	.448	-1.609	1.609

**Table 4F: 2020 Credit Adoption Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
cc_ttyp	1909	18.222	28.755	0	188.491
female	1909	.575	.494	0	1
age	1908	51.853	15.835	18	102
hhincome	1902	11.196	4.143	1	16
education	1907	11.251	2.284	1	16
working	1906	.56	.496	0	1
nonwhite	1909	.148	.355	0	1
census_division	1907	4.828	2.265	1	9
maritalstatus	1908	2.683	2.066	1	6
cc_accept2	1896	.086	.34	-1.609	1.609
cc_convenience2	1890	.18	.449	-1.609	1.609
cc_cost2	1895	-.423	.55	-1.609	1.609
cc_secure2	1895	.297	.818	-1.609	1.609
cc_setup2	1896	-.09	.448	-1.609	1.609

From 2019 values for credit adoption, Table 4E only shows a 0.3% drop in credit adoption trends within 2020. This presents to us that adoption may not have changed significantly between the period before the health crisis, versus during. Credit use also remains similar to that of 2019, with about a 9.6% average of transactions a month being done through credit, as shown in Table 4F.

## CHAPTER 4 REGRESSION RESULTS AND INTERPRETATION

### I. Data Results

#### a. Adoption and Use of Payment Methods During the Financial Crisis

**Table 1: 2008 Check Adoption Results**

chk_acnt_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.012	.01	-1.20	.231	-.033	.008	
age	.001	0	2.23	.026	0	.002	**
nonwhite	-.086	.016	-5.33	0	-.117	-.054	***
lf_emp	.005	.012	0.41	.685	-.019	.029	
married	.039	.012	3.29	.001	.016	.062	***
edu_lhs	-.443	.038	-11.51	0	-.518	-.367	***
edu_hs	-.047	.018	-2.58	.01	-.083	-.011	**
edu_sc	-.01	.015	-0.70	.482	-.039	.018	
edu_c	-.003	.014	-0.19	.85	-.031	.025	
inc_u25	-.073	.071	-1.03	.302	-.212	.066	
inc_2549	.003	.07	0.05	.96	-.133	.14	
inc_5074	.022	.069	0.32	.748	-.114	.159	
inc_7599	.007	.069	0.09	.924	-.13	.143	
inc_100124	.007	.07	0.10	.924	-.131	.145	
inc_o125	.003	.07	0.04	.968	-.135	.14	
statereside	0	0	0.13	.893	-.001	.001	
chk_cost2	-.028	.019	-1.46	.146	-.065	.01	
chk_speed2	-.004	.012	-0.33	.739	-.029	.02	
chk_setup2	.033	.014	2.38	.018	.006	.06	**
chk_security2	.002	.007	0.23	.816	-.012	.016	
chk_ctrl2	-.003	.009	-0.38	.706	-.02	.014	
chk_record2	.024	.009	2.62	.009	.006	.042	***
chk_accept2	.023	.016	1.49	.136	-.007	.054	
Constant	.911	.077	11.78	0	.759	1.063	***
Mean dependent var		0.968	SD dependent var			0.176	
R-squared		0.278	Number of obs			936	
F-test		15.286	Prob > F			0.000	
Akaike crit. (AIC)		-851.663	Bayesian crit. (BIC)			-735.464	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Table 1 displays the regression results for check adoption in 2008. Relative to check adoption for the year of 2008, a p-value outside of the significance range indicates that there is no statistically significant correlation between check adoption, based on gender. Explanatory variables that display a statistically significant correlation to check adoption, however, pertain to age, marital status, and education.

The “age” variable has a positive coefficient value, which shows that as age increases, the adoption of checks is more likely to occur. Respondents and individuals of an older age demographic were likely to utilize checks during 2008. The variable “married” is statistically significant in the story of check adoption, as the likelihood of adopting checks would increase if one is married, and decrease if an individual is unmarried. Respondents with less than a high



school education or with the completion of high school, have a lesser propensity to adopt checks, than if they had an educational attainment level above a high school education. The assessment characteristics of setup and record-keeping were significant to check adoption status, implying that individuals' perceptions around check adoption were correlated to how handy checks were for transactions, and how keeping track of spending was facilitated by check use.

**Table 2: 2008 Check Use Results**

chk_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.027	.011	-2.49	.013	-.048	-.006	**
age	.002	0	5.22	0	.001	.003	***
nonwhite	.014	.017	0.83	.406	-.019	.048	
lf_emp	.016	.013	1.25	.212	-.009	.041	
married	.026	.012	2.11	.035	.002	.05	**
edu_lhs	.063	.044	1.41	.158	-.024	.149	
edu_hs	.022	.019	1.15	.251	-.016	.06	
edu_sc	.011	.015	0.69	.488	-.019	.04	
edu_c	.009	.015	0.62	.536	-.02	.039	
inc_u25	-.224	.081	-2.75	.006	-.384	-.064	***
inc_2549	-.229	.08	-2.86	.004	-.387	-.072	***
inc_5074	-.247	.08	-3.08	.002	-.404	-.089	***
inc_7599	-.234	.08	-2.92	.004	-.392	-.077	***
inc_100124	-.25	.081	-3.09	.002	-.409	-.091	***
inc_o125	-.266	.081	-3.29	.001	-.424	-.108	***
stateside	0	0	-0.67	.501	-.001	0	
chk_cost2	-.008	.02	-0.39	.696	-.047	.031	
chk_speed2	.04	.013	3.09	.002	.015	.065	***
chk_setup2	.025	.015	1.68	.094	-.004	.054	*
chk_security2	.01	.008	1.29	.199	-.005	.024	
chk_ctrl2	.004	.009	0.48	.631	-.013	.022	
chk_record2	-.039	.01	-4.04	0	-.057	-.02	***
chk_accept2	-.008	.016	-0.52	.606	-.041	.024	
Constant	.319	.088	3.63	0	.146	.491	***
Mean dependent var		0.165	SD dependent var			0.165	
R-squared		0.118	Number of obs			920	
F-test		5.224	Prob > F			0.000	
Akaike crit. (AIC)		-771.540	Bayesian crit. (BIC)			-655.755	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

As represented in Table 2, the use, or share, of checks in 2008, on the other hand, is correlated with the gender of the respondent. If a respondent were a male, the likelihood of them using checks in typical monthly payments above other payment methods, would drop by about 0.03%. The inverse would be true for female respondents, who would increase their use of checks within their monthly payments by 0.03% during 2008. Those who are older in age would be more likely to use checks within their rotation of monthly payments, relative to other payment methods at their disposal. Likewise, those with the marital status of being married were more likely to use checks, with their share of potential check usage increasing by about 0.03%. Across

all income levels, ranging from households with earnings of under \$25,000 to those making over \$125,000 a year, the frequency of checks being used toward monthly transaction balances, falls by an average of 0.24% across all income categories.

Data presented in Table 2 tells us that the assessment characteristics of speed of using checks, and record keeping capabilities associated with them, are inferred to have influenced why the users of checks did or did not gravitate toward using them for a fraction of their monthly expenditures during the financial crisis. Although the record-keeping aspect of checks is statistically significant and correlated with overall check usage shares, the correlation is negative, meaning that if the ease of storage or usefulness of checks in error or dispute resolution were to increase, the use of checks would not go up nor have the potential to be used more often, in times to come.

**Table 3: 2008 Debit Adoption Results**

dc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	.015	.024	0.63	.527	-.032	.062	
age	-.005	.001	-4.80	0	-.006	-.003	***
nonwhite	-.022	.038	-0.59	.558	-.096	.052	
lf_emp	-.001	.029	-0.04	.968	-.058	.056	
married	.038	.027	1.39	.165	-.016	.092	
edu_lhs	-.323	.089	-3.62	0	-.499	-.148	***
edu_hs	-.005	.043	-0.13	.899	-.089	.078	
edu_sc	-.016	.034	-0.48	.631	-.083	.05	
edu_c	-.024	.033	-0.72	.47	-.09	.041	
inc_u25	.008	.165	0.05	.962	-.316	.331	
inc_2549	.091	.162	0.56	.577	-.228	.409	
inc_5074	.066	.162	0.41	.684	-.252	.384	
inc_7599	.054	.162	0.33	.738	-.264	.372	
inc_100124	.084	.164	0.52	.607	-.237	.406	
inc_o125	.08	.163	0.49	.626	-.241	.4	
statereside	.001	.001	1.05	.296	-.001	.002	
dc_cost2	.039	.042	0.93	.353	-.043	.121	
dc_speed2	.025	.037	0.69	.492	-.047	.097	
dc_setup2	.115	.031	3.72	0	.054	.176	***
dc_security2	.001	.015	0.07	.942	-.028	.03	
dc_ctrl2	.031	.021	1.45	.148	-.011	.073	
dc_record2	.097	.02	4.79	0	.057	.136	***
dc_accept2	.096	.037	2.59	.01	.023	.169	***
Constant	.926	.179	5.18	0	.575	1.276	***
Mean dependent var		0.825	SD dependent var			0.381	
R-squared		0.159	Number of obs			935	
F-test		7.504	Prob > F			0.000	
Akaike crit. (AIC)		731.334	Bayesian crit. (BIC)			847.507	

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

2008 debit card adoption data from Table 3 shows that gender does not have a conspicuous correlation to adoption of debit. Those of higher age demographics and with less

than a high school education were less likely to adopt debit cards, as negative coefficient values existed for both of the aforementioned explanatory variables. Setup, record keeping, and acceptance of debit payments were all characteristics that make debit card adoption in the longer run, more likely. Debit cards display as being accessible and easy to utilize upon receipt, a reliable means to monitor spending, and useful at the point of sale.

The use of debit cards, or their more immediate frequency of use in monthly transactions, show that women likely used debit cards more for a short period of time during 2008. Males followed the opposite trajectory in debit usage, where their use of debit cards was less frequent on a monthly basis, relative to females. Table 4 below indicates a 0.04% increase in debit card usage shares occurred among female spenders during the cruxes of the financial crisis.

Respondents who completed high school and others who had some college education are displayed to have increased their use of debit cards by 0.1%, relative to other educational attainment levels. The locational, demographic variable of “statereside” indicates that the state in which a respondent lives, is correlated with their use of debit cards on a monthly basis. Location ties to the nature of a state being more urban or ruralized, which may impact if debit cards are mainstream at the point of sale, above more traditional payment methods, like cash. Speed, setup, and acceptance of debit cards play a role in consumers’ monthly use of debit, and the sum of payments that are made using debit.

Table 4: 2008 Debit Use Results

dc_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.043	.016	-2.74	.006	-.075	-.012	***
age	-.003	.001	-5.52	0	-.005	-.002	***
nonwhite	-.028	.025	-1.10	.27	-.077	.022	
lf_emp	.043	.019	2.27	.023	.006	.08	**
married	-.002	.018	-0.08	.933	-.037	.034	
edu_lhs	.04	.065	0.61	.539	-.087	.166	
edu_hs	.069	.028	2.49	.013	.015	.124	**
edu_sc	.105	.022	4.74	0	.061	.148	***
edu_c	.035	.022	1.60	.109	-.008	.078	
inc_u25	.204	.136	1.50	.135	-.063	.471	
inc_2549	.206	.135	1.53	.126	-.058	.47	
inc_5074	.205	.135	1.52	.128	-.059	.469	
inc_7599	.203	.135	1.50	.133	-.062	.467	
inc_100124	.176	.136	1.29	.196	-.091	.442	
inc_o125	.148	.135	1.09	.274	-.117	.413	
statereside	.001	.001	2.15	.032	0	.002	**
dc_cost2	.051	.028	1.86	.063	-.003	.105	*
dc_speed2	.07	.024	2.94	.003	.023	.117	***
dc_setup2	.088	.021	4.27	0	.048	.129	***
dc_security2	.013	.01	1.28	.2	-.007	.032	
dc_ctrl2	.023	.014	1.67	.094	-.004	.051	*
dc_record2	.022	.013	1.68	.094	-.004	.048	*
dc_accept2	.067	.024	2.75	.006	.019	.115	***
Constant	.168	.143	1.18	.24	-.113	.449	
Mean dependent var		0.267	SD dependent var			0.260	
R-squared		0.235	Number of obs			920	
F-test		11.938	Prob > F			0.000	
Akaike crit. (AIC)		-68.690	Bayesian crit. (BIC)			47.095	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Separately from debit, credit adoption observations were insignificant among the two genders (Table 5). Those with educational attainment levels of less than high school, high school education, and some college education, displayed lessened credit card adoption, with respondents with less than high school education showing the lowest propensity for adoption. Age is statistically significant in Table 5, indicating that as a respondent's age increases, credit card adoption would increase in tandem by about 0.005%. The setup of credit cards and the ability to keep track of transactions made using credit were characteristics that made consumers more likely to adopt credit cards during 2008.

**Table 5: 2008 Credit Adoption Results**

cc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	.006	.02	0.31	.759	-.034	.046	
age	.005	.001	5.81	0	.003	.006	***
nonwhite	-.021	.032	-0.67	.505	-.083	.041	
lf_emp	.031	.024	1.26	.209	-.017	.078	
married	.019	.023	0.83	.406	-.026	.064	
edu_lhs	-.491	.075	-6.54	0	-.639	-.344	***
edu_hs	-.119	.036	-3.27	.001	-.19	-.047	***
edu_sc	-.073	.028	-2.55	.011	-.128	-.017	**
edu_c	-.017	.028	-0.60	.551	-.072	.038	
inc_u25	-.211	.139	-1.52	.129	-.483	.061	
inc_2549	-.059	.136	-0.43	.667	-.326	.209	
inc_5074	-.027	.136	-0.20	.842	-.295	.241	
inc_7599	.002	.136	0.01	.989	-.266	.269	
inc_100124	.014	.138	0.10	.921	-.257	.284	
inc_o125	.014	.137	0.10	.921	-.256	.283	
statereside	0	.001	-0.34	.734	-.002	.001	
cc_cost2	-.017	.03	-0.56	.577	-.076	.043	
cc_speed2	.014	.029	0.47	.64	-.044	.071	
cc_setup2	.066	.022	2.98	.003	.022	.109	***
cc_security2	.011	.012	0.99	.321	-.011	.034	
cc_ctrl2	.018	.016	1.16	.245	-.013	.049	
cc_record2	.065	.017	3.72	0	.031	.099	***
cc_accept2	.043	.03	1.41	.159	-.017	.102	
Constant	.683	.151	4.54	0	.388	.979	***
Mean dependent var		0.870	SD dependent var			0.336	
R-squared		0.242	Number of obs			934	
F-test		12.605	Prob > F			0.000	
Akaike crit. (AIC)		401.871	Bayesian crit. (BIC)			518.018	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 6: 2008 Credit Use Results**

cc_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	.015	.015	1.00	.32	-.014	.043	
age	.002	.001	3.22	.001	.001	.003	***
nonwhite	.005	.023	0.21	.831	-.04	.05	
lf_emp	-.066	.018	-3.74	0	-.1	-.031	***
married	.018	.017	1.07	.284	-.015	.051	
edu_lhs	-.24	.06	-4.01	0	-.358	-.123	***
edu_hs	-.109	.026	-4.19	0	-.161	-.058	***
edu_sc	-.125	.021	-6.07	0	-.165	-.084	***
edu_c	-.048	.02	-2.39	.017	-.088	-.009	**
inc_u25	-.109	.111	-0.99	.325	-.326	.108	
inc_2549	-.086	.109	-0.79	.43	-.3	.128	
inc_5074	-.056	.109	-0.52	.605	-.271	.158	
inc_7599	-.047	.109	-0.43	.664	-.262	.167	
inc_100124	-.012	.11	-0.11	.911	-.228	.204	
inc_o125	.027	.11	0.25	.806	-.189	.242	
statereside	0	0	-0.50	.615	-.001	.001	
cc_cost2	.066	.022	3.03	.002	.023	.109	***
cc_speed2	.01	.021	0.46	.647	-.032	.051	
cc_setup2	-.013	.016	-0.82	.413	-.045	.018	
cc_security2	.015	.008	1.74	.082	-.002	.031	*
cc_ctrl2	-.008	.011	-0.69	.491	-.03	.014	
cc_record2	.047	.013	3.76	0	.023	.072	***
cc_accept2	.034	.022	1.57	.117	-.009	.077	
Constant	.318	.119	2.68	.008	.085	.551	***
Mean dependent var		0.236	SD dependent var			0.244	
R-squared		0.257	Number of obs			923	
F-test		13.512	Prob > F			0.000	
Akaike crit. (AIC)		-211.634	Bayesian crit. (BIC)			-95.771	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Just as the adoption of credit cards indicated, age and educational attainment levels also play a role in the monthly, more shorter-term projections of use of credit transactions, as shown in Table 6. Individuals of a higher age would be more likely to use credit cards to secure monthly

payments than those who are younger. Individuals within all educational attainment categories were less likely to use credit, with the aversion to credit usage diminishing slightly with higher educational attainment levels. Employment has a negative correlation with credit card payment shares, meaning that those who are employed in the labor force were not apt to utilizing credit for a greater sum of the payments they made in a month. The attributes of cost and record keeping abilities tied to credit use were notable in the data results. Individuals rating the costs (fees, penalties, interest paid) of credit as lower, produced a higher likelihood of credit use for payments.

**Table 7: 2012 Check Adoption Results**

chk_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.017	.011	-1.54	.123	-.039	.005	
age	.004	0	9.12	0	.003	.005	***
nonwhite	-.127	.017	-7.70	0	-.16	-.095	***
working_now	.048	.013	3.69	0	.022	.073	***
edu_hs	.23	.037	6.13	0	.156	.303	***
edu_sc	.226	.036	6.26	0	.156	.297	***
edu_c	.27	.037	7.28	0	.197	.343	***
edu_pgs	.272	.038	7.12	0	.197	.347	***
inc_lt25	-.154	.024	-6.50	0	-.2	-.107	***
inc_2549	-.017	.021	-0.81	.421	-.059	.025	
inc_5074	.013	.021	0.60	.551	-.029	.054	
inc_7599	.009	.023	0.39	.697	-.036	.054	
inc_gt125	.013	.025	0.53	.596	-.036	.063	
inc_gt200	-.007	.034	-0.22	.829	-.074	.06	
statereside	0	0	-0.51	.609	-.001	.001	
chk_accept2	.039	.014	2.68	.007	.01	.067	***
chk_cost2	-.044	.021	-2.09	.037	-.086	-.003	**
chk_convenience2	-.006	.014	-0.45	.656	-.034	.021	
chk_secure2	.038	.008	4.50	0	.021	.054	***
chk_setup2	-.038	.021	-1.79	.073	-.08	.004	*
Constant	.507	.048	10.56	0	.413	.601	***
Mean dependent var		0.913	SD dependent var			0.282	
R-squared		0.242	Number of obs			2023	
F-test		32.036	Prob > F			0.000	
Akaike crit. (AIC)		97.314	Bayesian crit. (BIC)			215.173	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

In Table 7, we are able to observe that the categories of age, race, education, and income play a role in check adoption for the year of 2012. Just like 2008, 2012 does not display there being a noteworthy correlation between gender and check adoption. The p-value for “age” being significant at the 1% level means that for this regression model, age is surely associated with the adoption of checks, but as age increases by one unit, check adoption would only increase by about 0.004%, which is not substantial. This can indicate that check adoption in 2012 was more

prevalent among respondents with a higher age, but not for a sustained period of time was this significant. The race variable of “nonwhite” indicated a statistically significant p-value just as “age” does, however, it can be concluded that the likelihood of a white respondent adopting a check is higher than a nonwhite respondent doing so.

2012 SCPC data split education into five categories, ranging from less than high school to post graduate studies. The regression results lead us to believe that education, as a whole, affects check adoption, with those having the equivalent of a college degree or higher being slightly more likely (about 0.04%) to adopt checks, than anyone with a lesser amount of educational attainment. Respondents with median average income levels or higher (\$50,000-125,000 a year) seem to adopt checks more so than those who are below that threshold.

The assessment variables of acceptance cost, security, and setup had statistically significant values for 2012, meaning that adoption of checks was dependent on those four factors being rated as important aspects for considering check use. Security and acceptance of checks were the two most important characteristics in gauging check adoption, with a one unit increase in either of them yielding about a 0.038-0.039% increase in check adoption. Conversely, negative coefficient values for setup and cost of check adoption signify that as the cost and acquisition of checks increases, then adoption of checks would be less likely.

Table 8: 2012 Check Use Results

chk_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
gender	.012	.006	1.99	.047	0	.024	**
age	.002	0	10.46	0	.002	.003	***
nonwhite	-.022	.009	-2.44	.015	-.04	-.004	**
working_now	-.004	.007	-0.52	.6	-.018	.01	
edu_hs	-.009	.022	-0.41	.684	-.052	.034	
edu_sc	-.012	.021	-0.56	.576	-.054	.03	
edu_c	-.022	.022	-1.00	.319	-.064	.021	
edu_pgs	-.018	.022	-0.81	.417	-.062	.026	
inc_lt25	-.011	.013	-0.83	.407	-.036	.015	
inc_2549	.015	.012	1.25	.211	-.008	.037	
inc_5074	.014	.012	1.22	.224	-.009	.037	
inc_7599	-.013	.012	-1.03	.301	-.037	.012	
inc_gt125	-.012	.014	-0.89	.374	-.039	.015	
inc_gt200	-.013	.019	-0.70	.487	-.049	.024	
statereside	0	0	-0.11	.913	0	0	
chk_accept2	.034	.008	4.27	0	.018	.049	***
chk_cost2	.002	.012	0.13	.897	-.021	.024	
chk_convenience2	-.032	.008	-4.24	0	-.047	-.017	***
chk_secure2	-.007	.005	-1.51	.131	-.016	.002	
chk_setup2	-.02	.012	-1.70	.09	-.042	.003	*
Constant	.006	.029	0.20	.841	-.052	.064	
Mean dependent var		0.112	SD dependent var		0.143		
R-squared		0.140	Number of obs		1967		
F-test		15.814	Prob > F		0.000		
Akaike crit. (AIC)		-2319.714	Bayesian crit. (BIC)		-2202.445		

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

In 2012, Table 8 displayed signs of gender correlating to the use/share of checks within the overall sum of payments consumers made in a month. If a respondent were older, they were more likely to use checks to complete transactions. White respondents were more likely to have a bigger share of their monthly payments be paid through checks, relative to nonwhite respondents. If a respondent were nonwhite, their share of check payments would be lower by 0.02%, compared to a white respondent. The acceptance and convenience of checks were perceived to draw consumers toward using them within their monthly payments, amongst other mediums of payment in 2012.



**Table 9: 2012 Debit Adoption Results**

dc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.027	.017	-1.59	.112	-.06	.006	
age	-.004	.001	-5.89	0	-.005	-.002	***
nonwhite	-.018	.025	-0.72	.471	-.067	.031	
working_now	.04	.02	2.03	.043	.001	.078	**
edu_lhs	-.348	.057	-6.11	0	-.46	-.236	***
edu_sc	.05	.025	2.01	.045	.001	.1	**
edu_c	.046	.028	1.67	.095	-.008	.1	*
edu_pgs	.002	.03	0.05	.959	-.057	.06	
inc_lt25	-.089	.036	-2.49	.013	-.158	-.019	**
inc_2549	0	.032	-0.01	.993	-.063	.063	
inc_5074	-.031	.032	-0.97	.33	-.094	.032	
inc_7599	-.027	.034	-0.78	.437	-.094	.041	
inc_gt125	-.042	.038	-1.11	.268	-.117	.033	
inc_gt200	-.016	.051	-0.31	.754	-.117	.085	
statereside	-.001	.001	-1.23	.219	-.002	0	
dc_accept2	.181	.026	6.88	0	.129	.232	***
dc_cost2	-.179	.034	-5.27	0	-.245	-.112	***
dc_convenience2	-.142	.048	-2.96	.003	-.237	-.048	***
dc_secure2	.042	.011	3.90	0	.021	.064	***
dc_setup2	-.1	.039	-2.59	.01	-.175	-.024	***
Constant	1.03	.056	18.41	0	.92	1.139	***
Mean dependent var		0.804	SD dependent var			0.397	
R-squared		0.134	Number of obs			2016	
F-test		15.489	Prob > F			0.000	
Akaike crit. (AIC)		1746.479	Bayesian crit. (BIC)			1864.265	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

As indicated in Table 9, debit card adoption was not significantly correlated to gender. It can be inferred that females were more likely than males to adopt credit cards, as the male correlation coefficient value is negative, which would be inverted for women. Older respondents showed a lower propensity to adopt debit cards, as did individuals with an educational attainment level below the completion of high school. Respondents with some college education or above, were likely to adopt debit cards.

As represented in Table 10 below, in terms of use, debit cards displayed a positive correlation with gender. The older the respondent was, the less likely they would use debit cards, similar to the case of debit adoption. White respondents were more likely to utilize debit cards on a monthly basis, leaving nonwhite individuals with a 0.04% decreased propensity to use debit cards. Those with yearly income levels exceeding and amounting to \$125,000 were less likely to use debit cards than with those at lower income levels. Lower amounts of educational attainment, such as having completed less than high school, were more likely than any other category of educational attainment to not use debit cards. The acceptance, cost, convenience, security, and

setup of debit card use were all statistically significant, however only acceptance and security associated with debit card usage displayed a positive correlation coefficient.

**Table 10: 2012 Debit Use Results**

dc_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.031	.011	-2.78	.006	-.053	-.009	***
age	-.004	0	-8.58	0	-.004	-.003	***
nonwhite	-.038	.017	-2.25	.024	-.071	-.005	**
working_now	.067	.013	5.11	0	.041	.092	***
edu_lhs	-.134	.041	-3.26	.001	-.215	-.053	***
edu_sc	.023	.017	1.37	.17	-.01	.056	
edu_c	-.019	.018	-1.04	.299	-.055	.017	
edu_pgs	-.048	.02	-2.41	.016	-.087	-.009	**
inc_lt25	.025	.024	1.06	.29	-.022	.072	
inc_2549	.055	.021	2.56	.011	.013	.097	**
inc_5074	.019	.021	0.89	.373	-.023	.061	
inc_7599	.022	.023	0.94	.346	-.023	.067	
inc_gt125	-.063	.025	-2.49	.013	-.112	-.013	**
inc_gt200	-.044	.034	-1.30	.193	-.111	.022	
stateside	0	0	-0.95	.342	-.001	0	
dc_accept2	.112	.018	6.34	0	.077	.146	***
dc_cost2	-.11	.023	-4.76	0	-.155	-.064	***
dc_convenience2	-.138	.032	-4.28	0	-.201	-.075	***
dc_secure2	.032	.007	4.38	0	.018	.046	***
dc_setup2	-.095	.026	-3.72	0	-.145	-.045	***
Constant	.454	.038	12.11	0	.38	.528	***
Mean dependent var		0.273	SD dependent var			0.271	
R-squared		0.194	Number of obs			1961	
F-test		23.388	Prob > F			0.000	
Akaike crit. (AIC)		65.760	Bayesian crit. (BIC)			182.965	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 11: 2012 Credit Adoption Results**

cc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
male	-.011	.016	-0.72	.474	-.042	.019	
age	.006	.001	10.44	0	.005	.007	***
nonwhite	-.113	.023	-4.89	0	-.158	-.067	***
working_now	.027	.018	1.50	.134	-.008	.062	
edu_lhs	-.098	.053	-1.87	.061	-.202	.005	*
edu_sc	.052	.023	2.22	.027	.006	.097	**
edu_c	.127	.026	4.97	0	.077	.177	***
edu_pgs	.143	.028	5.19	0	.089	.197	***
inc_lt25	-.305	.033	-9.24	0	-.37	-.24	***
inc_2549	-.091	.03	-3.06	.002	-.149	-.033	***
inc_5074	-.028	.03	-0.94	.347	-.086	.03	
inc_7599	.01	.032	0.32	.749	-.052	.072	
inc_gt125	.016	.035	0.46	.643	-.053	.085	
inc_gt200	-.012	.048	-0.26	.794	-.106	.081	
stateside	0	.001	0.83	.406	-.001	.001	
cc_accept2	.063	.026	2.38	.017	.011	.114	**
cc_cost2	-.012	.017	-0.72	.473	-.046	.021	
cc_convenience2	-.096	.061	-1.58	.114	-.215	.023	
cc_secure2	.046	.01	4.79	0	.027	.065	***
cc_setup2	-.116	.025	-4.69	0	-.165	-.068	***
Constant	.484	.052	9.33	0	.382	.586	***
Mean dependent var		0.798	SD dependent var			0.401	
R-squared		0.277	Number of obs			2018	
F-test		38.322	Prob > F			0.000	
Akaike crit. (AIC)		1427.851	Bayesian crit. (BIC)			1545.658	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

In 2012, gender's relationship to credit adoption was insignificant, as seen in Table 11. If an individual was older in age and white, they were more likely to adopt a credit card. If a respondent had some degree of college education or above, they were more apt to adopt a credit

card. If household income was at or below \$25,499, their credit adoption was not as likely, than if income levels were higher. Acceptance and security were characteristics of credit that boosted their adoption among consumers.

**Table 12: 2012 Credit Use Results**

cc_sh	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig.
male	.008	.01	0.78	.434	-.012	.028	
age	.001	0	3.35	.001	.001	.002	***
nonwhite	-.035	.015	-2.25	.025	-.065	-.004	**
working_now	-.059	.012	-4.95	0	-.082	-.035	***
edu_lhs	-.018	.037	-0.49	.622	-.091	.054	
edu_sc	.015	.015	0.99	.321	-.015	.045	
edu_c	.105	.017	6.28	0	.073	.138	***
edu_pgs	.127	.018	7.02	0	.092	.162	***
inc_lt25	-.118	.022	-5.41	0	-.161	-.075	***
inc_2549	-.08	.019	-4.12	0	-.118	-.042	***
inc_5074	-.023	.019	-1.17	.243	-.06	.015	
inc_7599	-.003	.021	-0.16	.87	-.044	.037	
inc_gt125	.04	.023	1.72	.085	-.005	.085	*
inc_gt200	.078	.031	2.52	.012	.017	.139	**
statereside	0	0	0.14	.888	-.001	.001	
cc_accept2	.014	.017	0.82	.413	-.02	.048	
cc_cost2	-.086	.011	-7.56	0	-.108	-.064	***
cc_convenience2	-.081	.04	-2.01	.045	-.161	-.002	**
cc_secure2	.031	.006	4.98	0	.019	.044	***
cc_setup2	-.048	.016	-2.96	.003	-.08	-.016	***
Constant	.184	.034	5.38	0	.117	.251	***
Mean dependent var		0.216	SD dependent var			0.252	
R-squared		0.226	Number of obs			1964	
F-test		28.416	Prob > F			0.000	
Akaike crit. (AIC)		-305.903	Bayesian crit. (BIC)			-188.665	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Mirroring credit adoption, gender had no significant observations, relative to credit use also (Table 12). The use of credit in 2012 was impacted by employment status, unlike adoption, as employed individuals displayed a lower share of their transactions being made through credit. The same trends for credit adoption across the age, education, and income variables persisted for credit use. Security of credit use was seen as the most importantly perceived characteristic.

Putting together findings for 2008 and 2012, in 2008, there were drops in check and debit use for males. Credit adoption and use for males in 2008 had no significant changes or statistical value. The aforementioned would imply that for females, during the midst of the financial crisis, check and debit use would slightly increase, with credit adoption and use not being changed to a point of statistical significance. Just like in 2008, check and debit use changes for male respondents were marginal in 2012, with check usage perceived to increase by 0.01%, and debit

use dropping by 0.03%. Debit and check use increases for females between 2008 and 2012 may indicate a sense of restored trust in bank-based payments, occurring after the peak years of the financial crisis.

### b. Adoption and Use of Payment Methods: COVID Health Crisis

**Table 13: 2019 Check Adoption Results**

chk_acnt_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.019	.009	2.15	.032	.002	.037	**
age	.002	0	7.14	0	.002	.003	***
hhincome	.016	.001	11.88	0	.014	.019	***
education	.015	.002	6.81	0	.01	.019	***
working	.054	.011	5.16	0	.034	.075	***
nonwhite	-.048	.014	-3.50	0	-.074	-.021	***
census_division	.001	.002	0.56	.575	-.003	.005	
maritalstatus	0	.002	0.15	.884	-.004	.005	
chk_accept2	-.021	.011	-1.95	.051	-.041	0	*
chk_convenience2	-.003	.01	-0.29	.769	-.023	.017	
chk_cost2	.031	.016	1.96	.05	0	.061	**
chk_secure2	.005	.007	0.80	.425	-.008	.019	
chk_setup2	.049	.013	3.70	0	.023	.075	***
Constant	.405	.033	12.17	0	.34	.47	***
Mean dependent var		0.921	SD dependent var			0.270	
R-squared		0.154	Number of obs			3325	
F-test		46.346	Prob > F			0.000	
Akaike crit. (AIC)		198.314	Bayesian crit. (BIC)			283.843	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Regression results for check adoption in 2019 display that a significant correlation between gender and check adoption exists (see Table 13). The p-value for the variable “female” shows a p-value of below 0.05, meaning that women were more apt to adopt checks than men in the long run, in 2019 at the 5% level. With the gender of a respondent being female, the likelihood of check adoption increases by 0.019%, which is very small, but still showing a generally positive correlation between check adoption and gender. When it comes to race, nonwhite respondents are represented as less likely to adopt checks, than white respondents by nearly 0.05%. The higher one’s educational attainment and household income levels are, the more likely they are to adopt checks. Those who are employed also have a higher chance of adopting checks, with check adoption increasing by 0.05%. If the setup for attaining checks remains relatively simple and the cost of obtaining checks is lower, then more individuals would consider further use of checks.

**Table 14: 2019 Check Use Results**

chk_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	-.223	.273	-0.82	.413	-.759	.312	
age	.051	.01	4.96	0	.031	.071	***
hhincome	.064	.042	1.52	.128	-.018	.146	
education	.085	.065	1.30	.193	-.043	.212	
working	.249	.324	0.77	.441	-.385	.884	
nonwhite	-1.235	.418	-2.96	.003	-2.054	-.416	***
census_division	-.151	.058	-2.59	.01	-.265	-.037	***
maritalstatus	-.223	.072	-3.09	.002	-.364	-.081	***
chk_accept2	.583	.325	1.80	.073	-.054	1.22	*
chk_convenience2	1.866	.313	5.96	0	1.252	2.479	***
chk_cost2	-.037	.481	-0.08	.938	-.98	.905	
chk_secure2	-.301	.206	-1.46	.143	-.705	.102	
chk_setup2	.571	.41	1.39	.163	-.232	1.375	
Constant	1.587	1.015	1.56	.118	-.403	3.577	
Mean dependent var		3.689	SD dependent var			6.392	
R-squared		0.078	Number of obs			2212	
F-test		14.317	Prob > F			0.000	
Akaike crit. (AIC)		14331.461	Bayesian crit. (BIC)			14411.284	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

As captured in Table 14, for the year of 2019, a significant correlation between gender and check use is not found. Notable statistics were relevant to, age, race, location, and the marital status of surveyed individuals. Significant at the 10% level, it holds true that the higher a respondent's age is, the more likely they are to use checks within their regular rotation of monthly transactions. Likewise, the region in which an individual lives within the US impacts whether or not checks are used to fulfill monthly transactions, also on the 10% level. The convenience of check use was the most highly perceived by consumers, in 2019. The aforementioned implies that the acquisition and ease of use of checks was rated highly by survey respondents, for the year in question.

**Table 15: 2019 Debit Adoption Results**

dc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.023	.013	1.73	.084	-.003	.049	*
age	-.001	0	-2.67	.008	-.002	0	***
hhincome	.01	.002	4.81	0	.006	.014	***
education	.005	.003	1.65	.098	-.001	.012	*
working	.069	.016	4.37	0	.038	.099	***
nonwhite	-.019	.02	-0.91	.362	-.059	.021	
census_division	.003	.003	1.07	.285	-.003	.009	
maritalstatus	.004	.003	1.06	.29	-.003	.01	
dc_accept2	.074	.02	3.66	0	.034	.114	***
dc_convenience2	.122	.016	7.40	0	.089	.154	***
dc_cost2	.101	.023	4.48	0	.057	.146	***
dc_secure2	.014	.008	1.73	.085	-.002	.03	*
dc_setup2	.097	.018	5.25	0	.061	.133	***
Constant	.628	.048	13.02	0	.534	.723	***
Mean dependent var		0.814	SD dependent var			0.389	
R-squared		0.115	Number of obs			3273	
F-test		32.430	Prob > F			0.000	
Akaike crit. (AIC)		2736.191	Bayesian crit. (BIC)			2821.500	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Taking a look at gender relative to adoption of debit cards, Table 15 displays females as having a higher likelihood of adopting debit cards, at the 10% level. There is not a very strong correlation between gender and debit card adoption in 2019. Also significant at the 10% level would be the correlation between educational attainment and debit card adoption, amongst the surveyed population. The higher the level of educational attainment is for a respondent, the more likely they are to adopt debit cards in 2019, by 0.05%. Other relevant variables are those of age, income, and employment status. Unlike the findings for 2008 and 2012, in 2019, as the age of the respondent increased, the likelihood of debit adoption fell. Those who were working had a higher propensity to adopt debit cards, than unemployed individuals.

**Table 16: 2019 Debit Use Results**

dc_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	1.86	1.31	1.42	.156	-.709	4.429	
age	-.245	.048	-5.11	0	-.339	-.151	***
hhincome	.537	.202	2.66	.008	.141	.933	***
education	-.794	.313	-2.54	.011	-1.408	-.18	**
working	4.291	1.558	2.75	.006	1.236	7.345	***
nonwhite	-3.816	2.005	-1.90	.057	-7.747	.115	*
census_division	.377	.279	1.35	.177	-.17	.925	
maritalstatus	-.149	.345	-0.43	.667	-.826	.529	
dc_accept2	4.543	1.989	2.28	.022	.642	8.443	**
dc_convenience2	5.157	1.655	3.12	.002	1.912	8.402	***
dc_cost2	6.42	2.244	2.86	.004	2.019	10.821	***
dc_secure2	.207	.813	0.25	.799	-1.388	1.801	
dc_setup2	6.355	1.812	3.51	0	2.801	9.91	***
Constant	33.067	4.755	6.95	0	23.742	42.391	***
Mean dependent var		21.752	SD dependent var			30.666	
R-squared		0.078	Number of obs			2210	
F-test		14.211	Prob > F			0.000	
Akaike crit. (AIC)		21250.527	Bayesian crit. (BIC)			21330.337	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Statistical results for 2019 do not display statistical significance between gender and use of debit as shown in Table 16. Adoption of debit may have been more significant than use of debit, likely since female respondents were using their existing debit cards regularly at the point of sale, instead of simply as a less-routine way to pay off their balances from month to month. Education and debit card use were negatively correlated for 2019, showing that the higher one's educational attainment level was, the less apt the respondent would be to use debit in their rotation of payments in future projections. Acceptance and cost were characteristics of debit use

that were most significant in determining a respondent's probability of increasing their share of debit utilization, in time to come.

**Table 17: 2019 Credit Adoption Results**

cc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.028	.012	2.31	.021	.004	.053	**
age	.005	0	11.68	0	.004	.006	***
hhincome	.031	.002	16.84	0	.027	.034	***
education	.022	.003	7.49	0	.017	.028	***
working	.029	.014	2.01	.044	.001	.058	**
nonwhite	-.073	.019	-3.89	0	-.11	-.036	***
census_division	-.001	.003	-0.54	.591	-.007	.004	
cc_accept2	.042	.019	2.22	.026	.005	.08	**
cc_convenience2	.074	.015	4.87	0	.044	.104	***
cc_cost2	.022	.011	1.92	.054	0	.044	*
cc_secure2	.014	.007	1.90	.057	0	.028	*
cc_setup2	.081	.014	5.60	0	.053	.109	***
Constant	-.086	.043	-2.00	.046	-.171	-.002	**
Mean dependent var		0.801	SD dependent var			0.400	
R-squared		0.269	Number of obs			3326	
F-test		101.817	Prob > F			0.000	
Akaike crit. (AIC)		2317.223	Bayesian crit. (BIC)			2396.647	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 18: 2019 Credit Use Results**

cc_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	-3.841	1.111	-3.46	.001	-6.019	-1.662	***
age	.063	.041	1.54	.123	-.017	.143	
hhincome	1.142	.165	6.92	0	.819	1.466	***
education	2.584	.269	9.60	0	2.057	3.112	***
working	-4.133	1.325	-3.12	.002	-6.731	-1.534	***
nonwhite	-1.658	1.708	-0.97	.332	-5.008	1.692	
census_division	.257	.238	1.08	.28	-.21	.723	
cc_accept2	-1.142	1.734	-0.66	.51	-4.544	2.259	
cc_convenience2	4.245	1.405	3.02	.003	1.49	6.999	***
cc_cost2	7.448	1.028	7.25	0	5.432	9.464	***
cc_secure2	2.13	.669	3.18	.001	.817	3.442	***
cc_setup2	2.512	1.349	1.86	.063	-.133	5.157	*
Constant	-21.648	3.954	-5.47	0	-29.403	-13.894	***
Mean dependent var		17.750	SD dependent var			27.810	
R-squared		0.181	Number of obs			2214	
F-test		40.518	Prob > F			0.000	
Akaike crit. (AIC)		20591.024	Bayesian crit. (BIC)			20665.157	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Table 17 indicates that the adoption of credit by females was on the rise in 2019, however by a small percentage (0.028%). This data finding can be interpreted as women not seeking out the adoption of new credit cards, but using the credit they already have in their possession, with more frequency. Table 18 shows that at the 1% level of significance, gender and credit use are correlated, since credit use dropped nearly 4%, if the respondent was a female. The inverse would hold true for males; male respondents would have about a 4% increase in credit use, during 2019. Household income levels, educational attainment, and employment status of respondents had much higher, positive correlation coefficient values for credit use, than for credit

adoption, representing that payments made through credit were starting to make up a larger sum of how monthly transactions were completed.

**Table 19: 2020 Check Adoption Results**

chk_acnt_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.013	.012	1.13	.257	-.01	.036	
age	.002	0	3.84	0	.001	.002	***
hhincome	.011	.002	6.65	0	.008	.015	***
education	.013	.003	4.80	0	.008	.018	***
working	.063	.013	4.84	0	.038	.089	***
nonwhite	-.072	.016	-4.41	0	-.104	-.04	***
census_division	0	.002	0.09	.926	-.005	.005	
maritalstatus	.007	.003	2.31	.021	.001	.013	**
chk_accept2	.017	.013	1.36	.173	-.008	.043	
chk_convenience2	.012	.013	0.89	.371	-.014	.037	
chk_cost2	.017	.02	0.88	.381	-.022	.056	
chk_secure2	.001	.009	0.17	.869	-.015	.018	
chk_setup2	.059	.017	3.48	.001	.026	.092	***
Constant	.539	.043	12.56	0	.455	.623	***
Mean dependent var		0.930	SD dependent var			0.255	
R-squared		0.126	Number of obs			1871	
F-test		20.585	Prob > F			0.000	
Akaike crit. (AIC)		-25.066	Bayesian crit. (BIC)			52.413	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 20: 2020 Check Use Results**

chk_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	-.735	.311	-2.36	.018	-1.345	-.124	**
age	.074	.011	6.58	0	.052	.096	***
hhincome	-.076	.046	-1.66	.097	-.167	.014	*
education	.05	.074	0.68	.496	-.095	.195	
working	.998	.355	2.81	.005	.302	1.694	***
nonwhite	-.603	.441	-1.37	.172	-1.468	.262	
census_division	-.101	.067	-1.52	.128	-.232	.029	
maritalstatus	-.215	.081	-2.66	.008	-.373	-.057	***
chk_accept2	.756	.347	2.18	.029	.076	1.437	**
chk_convenience2	1.723	.355	4.86	0	1.028	2.419	***
chk_cost2	.332	.538	0.62	.537	-.723	1.386	
chk_secure2	-.088	.231	-0.38	.702	-.541	.364	
chk_setup2	.875	.46	1.90	.057	-.028	1.777	*
Constant	1.795	1.156	1.55	.121	-.472	4.061	
Mean dependent var		3.423	SD dependent var			6.765	
R-squared		0.087	Number of obs			1875	
F-test		13.690	Prob > F			0.000	
Akaike crit. (AIC)		12345.923	Bayesian crit. (BIC)			12423.432	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Table 19 values pose that gender and check adoption do not interact with one another significantly. On the other hand, Table 20 indicates that females were using checks less frequently than males during 2020. Age, employment and marital statuses were other significant variables, impacting check use to marginal degrees. If a survey respondent identified as working, the likelihood of them using checks within the sum of transactions they make within a month would increase by almost 1%. As the age of a respondent got higher, the more they were likely to utilize checks in their rotation of payment methods. The most significant assessment



characteristic attributed to increases in check use, was that of acceptance of payments made through checks.

**Table 21: 2020 Debit Adoption Results**

dc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.013	.017	0.78	.436	-.02	.047	
age	-.001	.001	-1.97	.049	-.002	0	**
hhincome	.009	.003	3.65	0	.004	.014	***
education	.003	.004	0.70	.484	-.005	.011	
working	.082	.019	4.26	0	.044	.121	***
nonwhite	-.025	.024	-1.03	.304	-.072	.023	
census_division	.007	.004	2.00	.046	0	.014	**
maritalstatus	.011	.004	2.54	.011	.003	.02	**
dc_accept2	.095	.025	3.74	0	.045	.145	***
dc_convenience2	.073	.021	3.43	.001	.031	.115	***
dc_cost2	.097	.031	3.17	.002	.037	.157	***
dc_secure2	.012	.011	1.10	.27	-.009	.032	
dc_setup2	.114	.024	4.77	0	.067	.16	***
Constant	.63	.061	10.27	0	.51	.75	***
Mean dependent var		0.835	SD dependent var			0.372	
R-squared		0.110	Number of obs			1845	
F-test		17.407	Prob > F			0.000	
Akaike crit. (AIC)		1394.647	Bayesian crit. (BIC)			1471.930	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 22: 2020 Debit Use Results**

dc_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.61	1.551	0.39	.694	-2.433	3.652	
age	-.233	.054	-4.31	0	-.339	-.127	***
hhincome	.071	.23	0.31	.756	-.38	.523	
education	-1.024	.368	-2.79	.005	-1.745	-.303	***
working	7.063	1.763	4.01	0	3.606	10.52	***
nonwhite	-2.29	2.194	-1.04	.297	-6.593	2.014	
census_division	-.054	.332	-0.16	.87	-.705	.597	
maritalstatus	-.137	.402	-0.34	.732	-.925	.65	
dc_accept2	6.113	2.325	2.63	.009	1.553	10.673	***
dc_convenience2	3.419	1.947	1.76	.079	-.401	7.238	*
dc_cost2	6.698	2.763	2.42	.015	1.28	12.116	**
dc_secure2	1.447	.965	1.50	.134	-.445	3.34	
dc_setup2	4.551	2.168	2.10	.036	.299	8.802	**
Constant	42.164	5.552	7.59	0	31.276	53.052	***
Mean dependent var		23.470	SD dependent var			33.219	
R-squared		0.062	Number of obs			1875	
F-test		9.432	Prob > F			0.000	
Akaike crit. (AIC)		18365.104	Bayesian crit. (BIC)			18442.613	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

From Table 21, we find that debit adoption does not display a significant correlation to gender. Debit use shares also do not show any significant correlation to gender (Table 22) in 2020. Age, for both adoption and use, was a statistically significant variable, representing that as age increased, debit card adoption and use fell by an average of nearly 0.1%. Geographic location and marital status were the most significant variables in connection to 2020 debit adoption, showing that the region in which respondents lived played a role in debit adoption,

while those who were married had a higher probability of adopting debit, than using debit as more of a shorter-term payment instrument. Positive responses to the cost and convenience associated with debit, played a role in how likely a respondent was to adopt this payment method. On the other hand, preferences around use of debit were determined mostly by its cost and setup. If costs associated with debit use were perceivably low to consumers, and setup was relatively simple, there would be about a 6.7% increase in debit use, based on cost, and a 4.6% increase in debit use, based on setup. Adoption of debit does not have as significant results as use, relative to its assessment characteristics.

**Table 23: 2020 Credit Adoption Results**

cc_adopt	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	.01	.016	0.63	.53	-.022	.042	
age	.004	.001	7.73	0	.003	.005	***
hhincome	.026	.002	11.22	0	.022	.031	***
education	.028	.004	7.35	0	.021	.036	***
working	.035	.019	1.91	.057	-.001	.072	*
nonwhite	-.064	.023	-2.80	.005	-.109	-.019	***
census_division	-.001	.003	-0.39	.694	-.008	.005	
cc_accept2	-.022	.024	-0.91	.363	-.069	.025	
cc_convenience2	.066	.02	3.33	.001	.027	.106	***
cc_cost2	.057	.015	3.91	0	.029	.086	***
cc_secure2	.044	.01	4.45	0	.025	.063	***
cc_setup2	.11	.019	5.78	0	.073	.147	***
Constant	-.042	.056	-0.76	.449	-.151	.067	
Mean dependent var		0.799	SD dependent var			0.401	
R-squared		0.293	Number of obs			1865	
F-test		64.032	Prob > F			0.000	
Akaike crit. (AIC)		1261.092	Bayesian crit. (BIC)			1332.995	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Table 24: 2020 Credit Use Results**

cc_typ	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
female	-5.886	1.266	-4.65	0	-8.368	-3.404	***
age	-.014	.044	-0.31	.756	-.099	.072	
hhincome	1.185	.183	6.46	0	.825	1.544	***
education	1.886	.303	6.23	0	1.292	2.479	***
working	-2.136	1.445	-1.48	.14	-4.971	.698	
nonwhite	-2.596	1.791	-1.45	.147	-6.109	.917	
census_division	-.206	.272	-0.76	.45	-.74	.328	
cc_accept2	-1.039	1.876	-0.55	.58	-4.719	2.641	
cc_convenience2	4.705	1.559	3.02	.003	1.647	7.762	***
cc_cost2	9.048	1.148	7.88	0	6.797	11.3	***
cc_secure2	2.444	.774	3.16	.002	.927	3.962	***
cc_setup2	.526	1.489	0.35	.724	-2.396	3.447	
Constant	-7.097	4.348	-1.63	.103	-15.625	1.43	
Mean dependent var		18.365	SD dependent var			28.830	
R-squared		0.162	Number of obs			1872	
F-test		30.018	Prob > F			0.000	
Akaike crit. (AIC)		17591.058	Bayesian crit. (BIC)			17663.010	

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$

From Table 23, it can be concluded that adoption of credit and gender do not have a significant relationship, in 2020. Credit use, however, displays correlation to gender, at the 1% level of significance. If the respondent is female, the likelihood of credit use in 2020 falls by nearly 6%, which means that male credit use would increase to about 6% during the COVID crisis (Table 24). As age increases, credit card adoption increases. As household income levels rose, educational attainment levels were higher, and employment increased, then credit card adoption displayed signs of rising as well. White respondents were more likely to utilize and adopt credit, more so than their nonwhite counterparts. The acceptance, convenience, and setup of credit cards made them more likely to be adopted by respondents in 2020.

Overall, pertaining to the COVID health crisis period, little significance exists for the adoption of checks and debit among females, in 2019. Female credit adoption values were marginal, however, credit use for women decreased by nearly 4% in 2019. The aforementioned would imply that for males, credit usage increased by about 4%, with their debit and check adoption propensities decreasing for 2019. 2020 regression results indicate that relative to 2019, checks were being ditched by females, in terms of use. Debit use was likely not changing very much, and was sustained in moderation. Credit card use for females further dropped from 2019

levels, with a 2% decrease from 2019 values, by 2020. A two percent decrease in credit use for females indicates that women were less likely to utilize credit to cover a large share of their monthly transactions during the COVID crisis. Males, on the other hand, displayed a higher likelihood for utilizing credit for month to month expenditures during the COVID crisis, paired with a slight increase (0.7%) in their probability of using checks between 2019 and 2020.

## CHAPTER 5

### Conclusions

#### I. Summary of Overall Findings

Overall, the OLS regression model and relevant equations were able to put together a story about how gender may play a role in varied payment choices during crises, and which variables tend to have an impact on adoption and use of checks, debit, and credit. As a net outcome, we found that trends in use are much more relevant to getting a snapshot of consumer payment behavior, as we get to see which payment instruments have the potential of becoming more regularly used. Use is also a more changeable aspect of payment choice, which helps us to see how certain economic conditions may cause temporary adjustments in how people transact. We find that for the years looking at the financial crisis, 2008 and 2012, adoption for checks, debit, and credit is not as significant as observations on their use. Females were found to have increased check and debit usage during the financial crisis, while men found themselves doing the opposite. Female debit use increases can be attributed to trust within the banking system being slowly restored in post-recession years. Even after the financial crisis, men were seemingly averse to debit usage, increased their check usage slightly, and no significant findings were encountered for 2012 credit adoption or usage, just as in 2008

The COVID health crisis showed us that females were more likely to have acquired a source of credit by the year of 2019, but their actual usage of credit was decreasing, in terms of how frequently credit was used for transactions. By the midst of the COVID crisis in 2020, women significantly dropped their credit use, relative to 2019 values. Males, during the COVID health crisis, remained indifferent to debit use, but increased their credit use. Check use amongst men, just as during the financial crisis, increased in the period following the primary onset of the health crisis. Security was often a positively noted attribute of checks, which shows us that

payment methods with higher security ratings are likely to grow in use, during times of economic decline.

Age, employment status, and educational attainment were explanatory variables which for both crises, seemed to show the strongest correlations to adoption and use. Older respondents were more likely to forego debit and credit options during times of crisis, and those who were employed were more apt to adopting and using debit and credit than those who were not. The more educated a respondent would be, the greater the likelihood they would have of using and adopting slightly 'riskier' payment instruments, like credit.

Socioeconomic status and individual risk tolerance levels of respondents play a major role in the outcomes for this study, especially relative to gender. Females have a higher propensity to be risk averse, and that shows through their handling of finances being a lot more secure, debit and check-related during times of financial or health crisis. Males, on the other hand, naturally are more risk tolerant, hence debit adoption and use across all years in question, showed little to no significance when considered next to credit. Variations in payment choice reflect how consumers ultimately cope with their finances, during times of crises. For the aforementioned reason, studying consumer payment behavior throughout times of crisis is valuable to our understanding of how various shocks to our economy can alter the ways in which consumers transact and manage their expenditures.

Several researchers, including Schuh and Stavins (2011), have utilized the Heckman, two-step model of regressions, to better understand adoption and use, relative to a series of explanatory variables, instead of OLS. The Heckman model would be optimal for cross-sectional data provided by the SCPC, as more nuanced insight for changes and continuities in payment over time would have been displayed through that regression model. A two-part, OLS regression

model had to be adopted for this study, due to difficulties within the data collection process. If a study on gender and payment choice were to be re-done, it would be optimal if a Heckman model of regressions would be used. Additionally, due to the somewhat ongoing and uncertain nature of the COVID crisis, more spaced-out data on consumer payments is not available, making it difficult to make more robust projections on what payment instruments are likely to prevail, in the post-pandemic world.

Creating ungendered government policies to protect the demographics of people who are most vulnerable to financial instability by crises would be the first step in mitigating crisis-based financial devastation. For example, safer banking and lending options should be considered for single mothers, the elderly, and for young adults, to decrease risk-based aversions to methods like debit, or credit for finances. Furthermore, dismantling the close tie between gender roles and social relations would help to give women and men more equal opportunities to contribute to in-home, and out of home labor, therefore lessening gender-centered shocks in employment during crises. During the COVID crisis, for example, women were found to contribute a greater amount of their time to housework and tending to children, as opposed to working jobs (Del Boca et al. 2020). If the government would go forward with creating more childcare and educational programming for working mothers, women would be able to work more, relative to men, and be less likely to experience harsh financial impacts in times of economic downturn. In countries like Italy, for example, the COVID crisis warranted the Italian government to hand out baby-sitting vouchers to women, when businesses reopened after lockdown (Del Boca et al. 2020). Additionally, adjustments to parental leave policies during the pandemic in Italy also prove to be resourceful (Del Boca et al. 2020). If the US were to develop policies to provide more leniency and relief to certain demographics within the population both during and after

crises, negative implications on individual and household finances would not be so unilaterally impacted, on the basis of gender



## BIBLIOGRAPHY

- Alon, Titan, Matthias Doepke, Jane Olmstead-Rumsey, and Michèle Tertilt. This time it's different: The role of women's employment in a pandemic recession. No. w27660. National Bureau of Economic Research, 2020.
- Arango, Carlos, Kim P. Huynh, and Leonard Sabetti. "Consumer payment choice: Merchant card acceptance versus pricing incentives." *Journal of Banking & Finance* 55 (2015): 130-141.
- Bounie, David, Abel François, and Leo Van Hove. "Consumer payment preferences, network externalities, and merchant card acceptance: An empirical investigation." *Review of Industrial Organization* 51, no. 3 (2017): 257-290.
- Ching, Andrew T., and Fumiko Hayashi. "Payment card rewards programs and consumer payment choice." *Journal of Banking & Finance* 34, no. 8 (2010): 1773-1787.
- Dalton, Michael. "Geographic impact of COVID-19 in BLS surveys by industry." *Monthly Labor Review* (2020): 1-80.
- Dang, Hai-Anh H, and Cuong Viet Nguyen. "Gender Inequality during the Covid-19 Pandemic: Income, Expenditure, Savings, and Job Loss." *World development*. Elsevier Ltd., April 2021. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8446715/>.
- Del Boca, Daniela, Noemi Oggero, Paola Profeta, and Mariacristina Rossi. "Women's and men's work, housework and childcare, before and during COVID-19." *Review of Economics of the Household* 18 (2020): 1001-1017.
- Eckel, Catherine C., and Philip J. Grossman. "Men, women and risk aversion: Experimental evidence." *Handbook of experimental economics results* 1 (2008): 1061-1073.
- Farré, Lúdia, Yarine Fawaz, Libertad González, and Jennifer Graves. "Gender inequality in paid and unpaid work during covid-19 times." *Review of Income and Wealth* 68, no. 2 (2022): 323-347.
- Foster, Kevin, and Claire Greene. "Consumer behaviour in a health crisis: What happened to cash?." *Journal of Payments Strategy & Systems* 15, no. 2 (2021): 188-196.
- Foster, Kevin, Claire Greene, and Joanna Stavins. "The 2020 survey of consumer payment choice: Summary results." *Federal Reserve Bank of Atlanta, Research Data Reports* 21-1 (2021).

- Foster, Kevin, Erik Meijer, Scott Schuh, and Michael A Zabek. "The 2008 Survey of Consumer Payment Choice." Federal Reserve Bank of Boston. Public Policy Discussion Papers, April 2010.  
<https://www.bostonfed.org/publications/public-policy-discussion-paper/2009/the-2008-survey-of-consumer-payment-choice.aspx>.
- Foster, Kevin, Erik Meijer, Scott D. Schuh, and Michael A. Zabek. "The 2009 survey of consumer payment choice." *FRB of Boston Public Policy Discussion Paper* 11-1 (2011).
- Goodman, Christopher J., and Steven M. Mance. "Employment loss and the 2007-09 recession: An overview." *Monthly Lab. Rev.* 134 (2011): 3.
- Greene, Claire, Ellen Mary, and Joanna Stavins. "Has COVID Changed Consumer Payment Behavior?" EconStor, 2021.  
<https://www.econstor.eu/bitstream/10419/250729/1/wp2112.pdf>.
- Grüschow, Robert Maximilian, Jan Kemper, and Malte Brettel. "How Do Different Payment Methods Deliver Cost and Credit Efficiency in Electronic Commerce?" *Electronic Commerce Research and Applications*. Elsevier, June 3, 2016.  
[https://www.sciencedirect.com/science/article/pii/S1567422316300357?ref=pdf\\_download&fr=RR-2&rr=75484482aa33176c](https://www.sciencedirect.com/science/article/pii/S1567422316300357?ref=pdf_download&fr=RR-2&rr=75484482aa33176c).
- Hashem, Tareq N. "Examining the Influence of COVID 19 Pandemic in Changing Customers ..." ResearchGate, July 14, 2020.  
[https://www.researchgate.net/profile/Tareq-Hashem/publication/342888188\\_Examining\\_the\\_Influence\\_of\\_COVID\\_19\\_Pandemic\\_in\\_Changing\\_Customers%27\\_Orientation\\_towards\\_E-Shopping/links/5f0c2041a6fdcc4ca4662f12/Examining-the-Influence-of-COVID-19-Pandemic-in-Changing-Customers-Orientation-towards-E-Shopping.pdf](https://www.researchgate.net/profile/Tareq-Hashem/publication/342888188_Examining_the_Influence_of_COVID_19_Pandemic_in_Changing_Customers%27_Orientation_towards_E-Shopping/links/5f0c2041a6fdcc4ca4662f12/Examining-the-Influence-of-COVID-19-Pandemic-in-Changing-Customers-Orientation-towards-E-Shopping.pdf).
- Herbst-Murphy, Susan. "Trends and preferences in consumer payments: Updates from the visa payment panel study." *FRB of Philadelphia Payment Cards Center Discussion Paper* 15-02 (2015).
- Hernandez, Lola, Nicole Jonker, and Anneke Kosse. "Cash versus debit card: The role of budget control." *Journal of Consumer Affairs* 51, no. 1 (2017): 91-112.
- Horvath, Akos, Benjamin S. Kay, and Carlo Wix. "The COVID-19 shock and consumer credit: Evidence from credit card data." Available at SSRN 3613408 (2021).
- Huterska, Agnieszka, Anna Iwona Piotrowska, and Joanna Szalacha-Jarmużek. "Fear of the COVID-19 Pandemic and Social Distancing as Factors Determining the Change in Consumer Payment Behavior at Retail and Service Outlets." MDPI. Multidisciplinary

- Digital Publishing Institute, July 11, 2021.  
<https://www.mdpi.com/1996-1073/14/14/4191>.
- Kenny, Charles, and George Yang. "New Estimates of the Impact of COVID-19 on Women's Jobs and Enterprises." Center for Global Development. Available at <https://www.Cgdev.org/sites/default/files/new-estimates-impact-covid-19-womens-jobs-and-enterprises>. Pdf (2021).
- Kubota, So, Koichiro Onishi, and Yuta Toyama. "Consumption responses to COVID-19 payments: Evidence from a natural experiment and bank account data." *Journal of Economic Behavior & Organization* 188 (2021): 1-17.
- O'Neill, Barbara, and Jing Jian Xiao. Financial Behaviors Before and After the Financial Crisis: Evidence from an Online Survey . DigitalCommons URI, 2012.  
[https://digitalcommons.uri.edu/cgi/viewcontent.cgi?article=1002&context=hdf\\_facpubs](https://digitalcommons.uri.edu/cgi/viewcontent.cgi?article=1002&context=hdf_facpubs).
- Rodriguez, Zachary, and Scott Schuh. "How Exposure To Identity Theft Affects Consumer Payment Behavior: Evidence From The Wendy's Restaurant Data Breach." January 2023, 1–33.
- Samphantharak , Krislert, Scott Schuh, and Robert M. Townsend. "Integrated Household Surveys: An Assessment of US Methods And An Innovation." Wiley Online Library, October 2017. <https://onlinelibrary.wiley.com/doi/abs/10.1111/ecin.12489>.
- Schuh, Scott. "Measuring Consumer Expenditures with Payment Diaries." EconStor, 2017.  
<https://www.econstor.eu/bitstream/10419/171787/1/890589836.pdf>.
- Schuh, Scott D., and Joanna Stavins. "How consumers pay: Adoption and use of payments." (2011).
- Stavins, Joanna. "Consumer preferences for payment methods: Role of discounts and surcharges." *Journal of Banking & Finance* 94 (2018): 35-53.
- Stavins, Joanna. "Credit card debt and consumer payment choice: what can we learn from credit bureau data?." *Journal of Financial Services Research* 58, no. 1 (2020): 59-90.
- "Survey of Consumer Payment Choice." Federal Reserve Bank of Atlanta, 2008.  
<https://www.atlantafed.org/banking-and-payments/consumer-payments/survey-of-consumer-payment-choice>.
- Foster, Kevin. "Codebook and Data Guide to the 2019 Survey of Consumer Payment Choice." Atlanta Fed. Federal Reserve Bank of Atlanta, 2020.

[https://www.atlantafed.org/-/media/documents/banking/consumer-payments/survey-of-consumer-payment-choice/2020/scpc2020\\_codebook.pdf](https://www.atlantafed.org/-/media/documents/banking/consumer-payments/survey-of-consumer-payment-choice/2020/scpc2020_codebook.pdf).

Foster, Kevin. "Codebook and Data Guide to the 2020 Survey of Consumer Payment Choice." Atlanta Fed. Federal Reserve Bank of Atlanta, 2021.

[https://www.atlantafed.org/-/media/documents/banking/consumer-payments/survey-of-consumer-payment-choice/2020/scpc2020\\_codebook.pdf](https://www.atlantafed.org/-/media/documents/banking/consumer-payments/survey-of-consumer-payment-choice/2020/scpc2020_codebook.pdf).

Hartmann, Heidi. "Gender implications of the financial crisis in the United States." Institute for Women's Policy Research (2009).

Verick, Sher. "Who is hit hardest during a financial crisis? The vulnerability of young men and women to unemployment in an economic downturn." (2009).

Wall, Howard J. "The "Man-Cession" of 2008-2009: Big but Not Unusual: St. Louis Fed." Saint Louis Fed Eagle. Federal Reserve Bank of St. Louis, December 9, 2021.

<https://www.stlouisfed.org/publications/regional-economist/october-2009/the-mancection-of-20082009-its-big-but-its-not-great>.

Wang, Zhu, and Alexander L. Wolman. "Payment choice and currency use: Insights from two billion retail transactions." *Journal of Monetary Economics* 84 (2016): 94-115.

Williams, Trenton A., Daniel A. Gruber, Kathleen M. Sutcliffe, Dean A. Shepherd, and Eric Yanfei Zhao. "Organizational response to adversity: Fusing crisis management and resilience research streams." *Academy of Management Annals* 11, no. 2 (2017): 733-769.

I affirm that I have carried out my academic endeavors with full academic honesty.

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