

**Bangor University**

## **DOCTOR OF PHILOSOPHY**

**Essays on consumer credit in the United Kingdom: Consumer protection, consumption and well-being, and financial resilience**

Castellanos Gamboa, Sergio

*Award date:*  
2020

*Awarding institution:*  
Bangor University

[Link to publication](#)

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Essays on consumer credit in the United Kingdom:  
Consumer protection, consumption and well-being,  
and financial resilience

Sergio Castellanos-Gamboa

Submitted in partial fulfillment of the requirements for the degree of Doctor  
of Philosophy in Banking and Finance at Bangor Business School

Doctoral Committee

Chair: Prof. Aziz Jaafar

External examiner: Prof. Meryem Duygun

Internal examiner: Dr. Danial Hemmings

Supervisors: Prof. Bernardo Bátiz-Lazo

Prof. Santiago Carbó-Valverde

August 4, 2020



PRIFYSGOL  
**BANGOR**  
UNIVERSITY

Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.

I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.

## Abstract

This dissertation explores consumer credit and its effects on the British economy and the British households. Chapter 1 offers a brief introduction to the issues around consumer credit that each of the subsequent chapters covers. Chapter 2 is the first empirical chapter and considers how the enactment of appropriate regulation can improve the understanding of the cost of credit. This chapter studies the effects of the Consumer Credit Act 1974 on the British economy through the introduction of the calculation and publication of the true cost of lending. Moreover, it tests the presence of a structural break in the relationship between the price and volume of consumer credit. Furthermore, the paper analyzes the effects of shocks to consumer credit on inflation and households' savings. Chapter 3 turns to analyze the impact of consumer credit on households' consumption and self-reported well-being across the income distribution. This chapter analyzes whether consumer credit can reduce consumption inequality by allowing poorer households to increase their consumption of consumer durables and leisure or, if on the contrary, it worsens self-reported measures of well-being. Next, chapter 4 studies households' financial resilience and evaluates the role that consumer credit plays in affecting it. This chapter answers the question *Is there a measure that correlates with households' probability of falling into financial distress and, moreover, predicts the likelihood of these households overcoming said distress?* To answer this question, this chapter proposes as a proxying measure the logarithmic ratio of households' financial assets and short-term liabilities. Moreover, this chapter reports the asymmetries of ownership of financial assets and short-term credit across the income and wealth distributions. Then it analyzes the effects of said proxy on the occurrence probability of a series of financial resilience-related events. Finally, chapter 5 offers tentative overall conclusions and points to a future research agenda.

*To my mother, María Cristina, who has always believed  
there is greatness in me, and who has showed me the path  
to achieve it.*

# Acknowledgments

I would like to start by thanking my supervisors, Bernardo Bátiz-Lazo and Santiago Carbó-Valverde. Doing a PhD has been the most overwhelming task on which I have ever embarked, and its completion would have not been possible, had I not crossed paths with them. They were always there for me along the entire process, not only to provide excellent supervision and guidance, but to support me in every way that I needed. I have learned so much from both of them and I will always be in debt with them. I would like my mentors to know that they can always count on me and that they will always find a friend in me.

At Bangor University, I met incredible people that have enriched my work and my life. I will surely fail if I try to mention every person that contributed in some way or another to my process, but please be sure that I will always value all that you did for me. Mohammed Ali was more than a friend and accepted me into his family, I will always cherish our never-ending talks, my brother. Valantis, you have always been kind to me, and I greatly appreciate our conversations. The excellent staff and PhD students at the Business School I crossed along the years challenged me with insightful debates that undoubtedly contributed to my reflecting and my work. My students, especially those keen to ask questions, helped me learn continuously in order to try to become a better lecturer for them.

Bangor University provided the facilities and resources to carry out my studies. However, through its various clubs and societies it also gave me the opportunity to get to know me better as a human being, and to try endless activities and meet countless people that made this chapter of my life as great as it was. Steve and Danielle Barnard symbolize everything that Bangor University should always strive to be; kind, loving, supporting, bold, encouraging, and funny. Please keep making Bangor the great place it is. Ray and Allyson, and the Catholic Society, always provided a home for me at Ty Acwin, in times of joy and in times of darkness. My first steps into Catholicism began here, and I dearly hope our paths will cross again.

Memo and Vanessa became my family in Bangor. Few times in my life I have felt I can let myself be and not feel judged. A spiritual guide and a confident, who

since the first day have always looked after me. You will always be family and I would be lost without you. To the people that were part of TGIF, to each one of you, thanks for bringing life to Bangor, I am looking forward to our reunion. Marti, I cannot express how important you are in my life. I am eternally grateful for all your support and your friendship. I will always be there for you, and never forget that you are amazing and that you will achieve all that you set out to do in life.

Daniela Benítez was an instrumental person in this journey. She showed me the value of self-love and the importance of mental health. She was always prompt at giving me a hand and providing me with kind words when I most needed them. You will always be in my heart and papi Carlos will always be my Guardian Angel. I wish you true happiness, and may you bring light and love to the life of many more lost souls.

Fabio Hernández is my best friend and more than a brother. A noble spirit that is always willing to support me and to be there for me, no questions asked. I am forever indebted to you. Luis Felipe Sáenz has always motivated me to become a better academic, but moreover, a better human being. I would have not studied a master's degree, let alone a PhD had it not been for you. You are a great person and I am blessed to count you as my close friend.

I would like to thank my family who love me dearly and has made sure that I always know it. Your words of confidence and trust in me were beyond anything for which I could have asked. You have waited patiently as I have been away and now I hope I have the chance to make it up to you. I love you with all my heart.

Last, but not least, to God. I found you along this journey and although I am still at a very early stage in the process of getting to know you, you have already done all for me. You have given meaning to my life and you have showed me what my true purpose and vocation is. With all my flaws and sins, you have forgiven me and filled me with never-ending love.

# Contents

<b>Acknowledgments</b>	<b>3</b>
<b>List of Figures</b>	<b>8</b>
<b>List of Tables</b>	<b>10</b>
<b>1 Introduction</b>	<b>11</b>
1.1 Motivation . . . . .	11
1.2 Objectives and main findings . . . . .	13
1.3 Overall contributions of the thesis . . . . .	16
<b>2 The APR as a consumer protection policy tool: The Consumer Credit Act 1974</b>	<b>19</b>
2.1 Introduction . . . . .	19
2.2 Industrial organization and legal framework of the consumer credit industry . . . . .	21
2.3 Evolution of consumer credit prior to the CCA74 . . . . .	22
2.4 Data set and summary statistics . . . . .	25
2.5 Effects of the CCA74 on consumer credit volumes . . . . .	30
2.6 Effects of the CCA74 on savings and inflation . . . . .	35
2.7 Summary . . . . .	39
<b>3 Consumer credit, consumption inequality, and self-reported well-being: Evidence from the BHPS and Understanding Society 1995-2013</b>	<b>42</b>
3.1 Introduction . . . . .	42
3.2 Literature review . . . . .	45
3.3 Data and methodology . . . . .	48
3.3.1 Descriptive statistics . . . . .	49
3.4 Econometric strategy . . . . .	55



3.4.1	Effect of consumer credit on household expenditures . . . . .	55
3.4.2	Effect of consumer credit on household well-being . . . . .	66
3.5	Summary . . . . .	70
<b>4</b>	<b>Household financial resilience and consumer credit: Evidence from the WAS 2010–2016</b>	<b>72</b>
4.1	Introduction . . . . .	72
4.2	Literature review . . . . .	78
4.3	Data and descriptive statistics . . . . .	84
4.3.1	Data . . . . .	84
4.3.2	Descriptive statistics . . . . .	85
4.4	Econometric strategy . . . . .	95
4.4.1	Methodological criteria . . . . .	97
4.5	Results . . . . .	100
4.5.1	Method comparison . . . . .	100
4.5.2	Households’ financial resilience in binary response variables events . . . . .	101
4.5.3	Negative financial shocks, savings, and consumer credit as burden . . . . .	110
4.6	Summary . . . . .	123
<b>5</b>	<b>Conclusions</b>	<b>128</b>
5.1	Main findings in empirical chapters . . . . .	128
5.2	Limitations . . . . .	130
5.3	Final remarks, policy implications, and future areas of research . . . .	131
	<b>Bibliography</b>	<b>133</b>
	<b>Appendices</b>	<b>146</b>
	<b>Appendix A Detailed historical narrative and statistical support for CCA74</b>	<b>147</b>
A.1	Further political, industrial, and regulatory background . . . . .	147
A.1.1	A period of political and economic change . . . . .	147
A.1.2	Consumer credit in the mid-20th century . . . . .	148
A.1.3	Main players and market makers . . . . .	150
A.1.4	Relevant regulation running up to the CCA74 . . . . .	152
A.2	Additional descriptive statistics . . . . .	153
A.3	Robustness checks of main results . . . . .	158

<b>Appendix B Detailed statistical support for consumption inequality, well-being, and consumer credit</b>	<b>161</b>
B.1 Detailed descriptive statistics . . . . .	161
<b>Appendix C Detailed statistical support for household financial re- silience and consumer credit</b>	<b>173</b>
C.1 Additional descriptive statistics . . . . .	173
C.2 Detailed method comparison . . . . .	179

# List of Figures

2.1	Volume and price of consumer credit across enactment of CCA74 . . .	29
2.2	IRFs of a shock to consumer credit on inflation and savings ratio . . .	38
3.1	Consumption and credit as percentage of income, and savings . . . .	50
3.2	RPI indices for different expenditure items . . . . .	59
4.1	Access to/ownership of financial assets by wealth and income distri- bution 2010-16 . . . . .	87
4.2	Ownership of store cards by income and wealth distributions 2010-16	90
4.3	Ownership of credit cards by income and wealth distributions 2010-16	91
4.4	Financial resilience across the income and wealth distributions . . . .	109
4.5	Distribution of Logarithmic Financial Ratio . . . . .	119
A.1	Savings and inflation (RPI) across enactment of CCA74 . . . . .	154
A.2	Income, consumption, and consumer credit across enactment of CCA74	154
A.3	Additional impulse - response functions from VAR models CCA74 . .	160

# List of Tables

2.1	Summary Statistics of whole sample CCA74 . . . . .	27
2.2	Effect of the Consumer Credit Act 1974 (APR) on consumer credit . .	32
2.3	VAR models and impulse-response functions of a shock in consumer credit on inflation and savings . . . . .	37
3.1	Households using consumer credit by product and income deciles . . .	51
3.2	HH XP, well-being, and debt-to-income ratio by income deciles . . . .	54
3.3	Effect of consumer credit on HH expenditure . . . . .	57
3.4	Effects of disaggregated consumer credit on HH expenditures . . . . .	60
3.5	Distributional effects of different consumer credit on HH expenditure	63
3.6	Effect of consumer credit on well-being . . . . .	66
3.7	Propensity score matching estimations . . . . .	69
4.1	Summary Statistics and t-tests - financial resilience . . . . .	93
4.2	Probability of falling behind with bills - method comparison . . . . .	99
4.3	Living expenses, liquidity, and financial resilience (marginal effects) .	104
4.4	Income drop and financial resilience (marginal effects) . . . . .	111
4.5	Saving for a rainy day and financial resilience (marginal effects) . . .	115
4.6	Debt burden and financial resilience (marginal effects) . . . . .	120
A.1	Data and sources CCA74 . . . . .	153
A.2	Unit-root tests of non-stationarity and KPSS of stationarity . . . . .	155
A.3	Effect of the Consumer Credit Act 1974 (APR) on consumer credit - Robustness checks . . . . .	158
A.4	Effect of the Consumer Credit Act 1974 (APR) on consumer credit - Butterworth filter . . . . .	159
B.1	Percentage of consumer credit by product and income deciles 1995 . .	164
B.2	Percentage of consumer credit by product and income deciles 2000 . .	164
B.3	Percentage of consumer credit by product and income deciles 2005 . .	165
B.4	Percentage of consumer credit by product and income deciles 2012-13	165

B.5	HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 1995 . . . . .	169
B.6	HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2000 . . . . .	170
B.7	HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2005 . . . . .	171
B.8	HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2012-13 . . . . .	172
C.1	Mean and median of HH wealth, financial resilience, well-being, and size wave 3 WAS . . . . .	177
C.2	Mean and median of HH wealth, financial resilience, well-being, and size wave 4 WAS . . . . .	178
C.3	Mean and median of HH wealth, financial resilience, well-being, and size wave 5 WAS . . . . .	179
C.4	Probability of keeping up with bills - method comparison . . . . .	182
C.5	Probability of ending period with no money - method comparison . . .	183
C.6	Probability of ending period with money - method comparison . . . .	184

# Chapter 1

## Introduction

### 1.1 Motivation

Credit has always been a determinant feature of capitalism ([Wray, 1990](#)). Moreover, credit has always been a determinant feature of human societies. In simple terms, one can understand any transaction between two parties as a credit arrangement that creates a creditor and a debtor, which is canceled when both parties have fulfilled their commitment toward said arrangement ([Innes, 1913](#)). Moreover, it is possible to trace regulation surrounding credit agreements thousands of years back, at least to the Hammurabi Code of ancient Mesopotamia, circa 1750 BC ([Logemann, 2012](#)). Nonetheless, the concept of consumer credit in the United Kingdom is considerably newer and dates to the interwar period, particularly to the 1930s with the massive spread of hire-purchase agreements for the acquisition of consumer durables ([Bowden, 1990](#); [O’Connell, 2009a](#); [Scott, 2002, 2008](#)), even though, credit for consumption purposes had already been a common element of Victorian Britain through check and credit trading in the form of Scotch drapers, tallymen, and credit drapers ([O’Connell, 2009b, 2009a](#)) and even hire-purchase agreements at a lower scale ([Scott, 2007](#)).

The current subclassification of personal credit arose after a market for personal lending to a large number of people could be established and resulted in being profitable for financial institutions. As [Hyman \(2012, p. 10\)](#) argued in the following quote, the relevance of consumer credit in financial markets appeared when credit itself became a tradable instrument:

Once debt could be sold, it could be invested in. Personal debt became a place for investors to put money, connecting it with the most basic operations of capitalism.<sup>1</sup>

---

<sup>1</sup>Although Hyman’s research focuses on the development of consumer credit markets in the

This phenomenon occurred when a series of conditions that had not arisen previously materialized simultaneously. Higher incomes for unskilled and semiskilled workers allowed this part of the population to accumulate enough wealth to move beyond subsistence consumption, including, among others, aspirational and hedonistic consumption and the procurement of real estate possession (Scott, 2007). In the United Kingdom, this was accompanied by an increase in the demand for consumer durables derived from the growth in home ownership (Samy, 2016; Scott, 2008). This, in turn, led to the appearance of the distinction between long-term mortgage credit destined for home purchases and short-term consumer credit, mainly in the form of hire-purchase agreements, for the acquisition of furniture, white goods, and other consumer durables from the 1930s onward. Likewise, the Bank of England promoted the development of the hire-purchase market during this period by directly investing in companies of this sector (Bowden & Collins, 1992).

Unfortunately, the legal specificities of hire-purchase agreements, particularly the transfer of ownership to the buyer at the end of the contract, created a disadvantageous atmosphere for consumers. Households had to assign an important part of their budget to the repayment of the hire-purchase agreements and were vulnerable to repossession of the goods bought with this instrument, even when falling behind with payments for a short period. This brought discontent and stigma to the use of these agreements (Scott, 2007). Nonetheless, the pressure created by the surge in aspirational consumption and the growing living standards portrayed by families pushing to *keep up with the Joneses* (Duesenberry, 1949) deemed the use of consumer credit a vital, though obscure, part of daily life in Britain. These events resulted in the passing of the Hire-Purchase Act 1938. Research by Thornely and Ziegel (1965) and others such as Scott (2002) showed that the introduction of this law did not address many of the existing market failures, and therefore term controls and amendments to this act were put in place. In the meantime, after the Second World War, Britain kept witnessing increasing economic growth and the development of an affluent society. By 1968, the appearance of new consumer credit instruments, such as the credit card, plus the many actors involved in the business of unsecured lending, combined with the dynamics of a consumerist society, turned the British consumer credit market into a very complex arena in which regulation was not considered to be fit for purpose and led to the establishment of the Crowther Committee.

This is precisely where this dissertation begins, while aiming to provide empirical

---

US around the car industry, this statement also applies for the UK. It was only until the finance houses, funding themselves through the clearing banks, actively took part in the consumer durables' business, that a market for consumer credit began its steady growth in Britain.

evidence of a series of components surrounding consumer credit that have showed to create market failures. These market failures have the potential to produce perverse incentives that cause agents to deviate from optimal choices in the demand and use of consumer credit. Moreover, these decisions could have negative effects on households and, when brought together, on the economy as a whole.

## 1.2 Objectives and main findings

The main goal of the three empirical chapters contained within this dissertation is to explore, first, the impact of legislation of consumer credit; second, issues around consumption inequality and subjective well-being; and third, British households' financial resilience and how this is linked to the income and net worth of families. One often takes these concepts for granted, as if agents interacted in a game with perfect information and complete rationality. Yet, studies in economic history, sociology, psychology, and behavioral economics, among others, have shown that these assumptions, rather than the norm, turn out to be the exception ([Mallard, 2015](#)). The entire analysis covers the evolution of consumer credit in the United Kingdom along a time dimension that spans about 50 years, starting with the appointment of the Crowther Committee in 1968, up to 2016, when the most recent data were available. This time span includes important episodes in the transformation of consumer credit in the United Kingdom, including the liberalization of financial markets during the 1980s and 1990s ([Offer, 2017](#)), and the transformation of the welfare state during the same period, that brought to the spotlight of economic growth a supposedly rational and empowered consumer ([Aveyard, Corthorn, & O'Connell, 2018](#)).

Chapter 2 looks at the concepts of consumer protection and the cost of consumer credit. To tackle this task, it reviews the effects of the passage of the Consumer Credit Act 1974 (CCA74) on the British economy. This piece of legislation established the requirement for retail financial institutions and credit granters to calculate and publish the true cost of lending – in the form of an annualized percentage rate (APR). The CCA74 also envisioned a restructuring of the regulation surrounding consumer credit in the United Kingdom, transforming this regulation from a disorganized web of legislation covering various aspects of this market into a unique regulatory environment. The restructuring of the legal framework around consumer credit also intended to improve legal rights of retail consumers because even though some of these rights were typified in English law, the technicalities involved in them implied that, *de facto*, individuals were not protected in real cases. Additionally, the passage of the CCA74 occurred at a time when the British government was fighting



inflationary pressures.

The 1970s was probably one of the most volatile decades in British history during peace time. There was a chain of important events taking place that transformed not only the British economy but also the entire world. The end of the Bretton Woods era, a secondary banking crisis, the biggest oil price crisis of the 20th century, and the change in the economic paradigm were some of the episodes that had major consequences for the political and socioeconomic spheres of the United Kingdom. That is the reason the chapter reviews in detail the role that different actors played in the passage of the CCA74, isolating it from other events, and in particular, around the process that led to the way in which credit granters and shopkeepers had to calculate and publish the APR.

The building of this historical narrative also enabled the reconstruction of a data series of consumer credit before 1975, which in turn informs the econometric strategy implemented in this chapter, allowing for the isolation of the effect of the passage of the CCA74 on the British economy from the other major episodes and shocks mentioned above. This strategy was carried out in two steps. First, the regressions analyze the relationship between prices and volumes of consumer credit and disentangle a structural break that results from the passage of the law and the efforts by the government to educate both credit issuers and consumers. The main argument is that the reduction in the information asymmetries empowered citizens to shop around for better deals, thus increasing competition among businesses and increasing the demand for consumer credit. In the second step, the chapter estimates a series of models that reports and illustrates the effects of a shock in the volumes of consumer credit on the response of inflation and household savings. This exercise's findings suggest that the Crowther Committee was right to argue that consumer credit would not increase inflationary pressures, nor would it motivate households to reduce their savings.

Chapter 3 evaluates the effects of consumer credit on households' expenditures and consumption inequality. It also examines the effects of using consumer credit on household well-being and assesses the extent to which these phenomena differ across the income distribution. This chapter thus empirically explores ideas around personal satisfaction and the cost of consumer credit. Specifically, it analyzes the effects of consumer credit on households' expenditures and well-being. Chapter 3 explores disaggregated data from the British Household Panel Survey and the United Kingdom Longitudinal Study, covering the period from 1995 to 2013. The author collected information for a range of expenditures that covered subsistence consumption, leisure, and consumer durables. In the same way, the author collected informa-

tion regarding the use of different consumer credit products, including hire-purchase agreements, personal loans, credit cards, mail order, and others. This setting enabled the study of the distributional effects of using consumer credit to fund said expenditures. Namely, chapter 3 aims to unravel the correlation between consumer credit and households' expenditures and to separate said correlation across income deciles. The main finding of this empirical chapter was that there were significant differences in the effects of using consumer credit across the income distribution that have the potential to reduce consumption inequality. In other words, empirical results suggested that poorer households could benefit more relative to wealthier households when they have access to consumer credit to fund utility-increasing consumption. This is for instance the case for poor households that have access to credit cards and hire-purchase agreements. This in turn indicates that financial inclusion, via access to fair and affordable credit products, can have positive effects, particularly for more vulnerable consumers. Additionally, the empirical exercises in this chapter revealed that access to consumer credit does not negatively affect self-reported well-being. Nonetheless, the outstanding level of indebtedness and through that channel, the likelihood of over-indebtedness, is highly correlated with a detriment of short- and long-term measures of mental well-being.

Chapter 4 studies financial resilience, which is defined as the ability households have to sustain and overcome a negative income shock. Redundancies or unemployment, illness, death of a relative, or divorce are the most common types of shocks that put pressure on individual consumer finance. However, natural disasters, financial and economic crises, or even pandemics are also a real threat. The overall consensus of the elements that should contain a financial resilience framework encompass economic resources, financial products and services, financial knowledge and behavior, and social capital (Anderson & Muir, 2018; McKnight, 2019; Muir et al., 2016; Salignac, Marjolin, Reeve, & Muir, 2019). Financial resilience is then considered to be the result of the combination of these dimensions with financial acuity. This means that individuals should have access to the aforementioned resources but should also have the abilities and skills to efficiently manage their finances, making appropriate choices to build their resistance capacity to withstand negative shocks and return to a previous equilibrium with the skills and resources at hand. Exploiting a longitudinal panel from the Wealth and Assets Survey that covers the period 2010–2016, the empirical investigation in chapter 4 studies British households' financial resilience and its nuances across the income and wealth distributions, analyzing ways to monitor it and suggesting ways in which it can be improved.

The econometric strategy in chapter 4 proposes the logarithmic financial assets

to short-term liabilities ratio as the most suitable index to measure and monitor financial resilience. The argument behind this proxy is that financial assets cover the resources to which individuals have access, and can liquidate, in case of financial distress initiated by a negative shock. Moreover, the short-term liabilities component reveals households' access to additional liquidity in case of distress but, at the same time, gives a signal as to the level of indebtedness or over-indebtedness with which households have to deal in case of distress. Following this, the chapter moves onto testing the ability of the financial resilience proxy to predict the likelihood of respondents facing liquidity shortages or surpluses and their ability to keep up with their regular expenditure commitments. After this, the chapter turns to analyzing the effects of the resilience proxy on the occurrence probability of three events. The first one is the time period for which households can cover their expenses after a negative income shock has occurred. The second is the likelihood that adjustments to this ratio will increase the probability of respondents "saving for a rainy day." The third considers the potential that consumer credit will turn into a burden. The overall message from these exercises is twofold. First, the measure portrays a high predictability power to monitor household financial resilience. Additionally, it demonstrates that the effects of adjusting this ratio will have more significant positive effects for families at the lower end of the income distribution.

Finally, chapter 5 aims to bring together the overall message of the entire dissertation, namely that consumer credit can bring significant and positive benefits to its users, if and only if people have the skills and knowledge to take advantage of these benefits, within a stable regulatory framework. This chapter also acknowledges the limitations of the empirical research in previous chapters that open the way for a future research agenda. Additionally, the Appendix contains supporting material that complements the three chapters. This material includes the political, industrial, and regulatory background in which the CCA74 was passed, along with additional descriptive statistics for each empirical chapter, and robustness checks of the econometric strategies used in these chapters.

### 1.3 Overall contributions of the thesis

This dissertation contributes to the field of household finance, and particularly the study of consumer credit in the United Kingdom in several ways. First, it adds to the research on legislation and its impact on financial markets and the economy. Specifically, this dissertation contributes to the argument that a stable and well-organized regulatory framework aids consumer protection. The key channel evaluated in this

work focuses on the impact that transparent price signals have on consumer financial markets. By providing a useful set of information accompanied by financial education, one can reduce asymmetries and facilitate the decision-making process of more knowledgeable agents that become proficient when shopping around for better deals in consumer credit markets. Moreover, this dissertation contributes to the study of one of the most volatile periods in the history of the United Kingdom. Through the combination of historical research and econometric exercises, this thesis disentangles the role that consumer credit played in creating or exacerbating inflationary pressures during the decade when the United Kingdom reached its highest recorded inflation rate in the last 300 years. Although the country was facing a period of stagflation and political and economic turmoil caused by a series of shocks (e.g., oil price crisis), consumer credit was not one of the catalysts or factors that worsened the political and socio-economic environment.

Second, this piece of work adds to the literature that looks into the effects of consumer credit on household consumption and well-being. On the one hand, this dissertation presents research on access and use of consumer credit across the income and wealth distributions, arguing that under the right circumstances these sources of liquidity can reduce consumption inequality and boost the consumption of utility-increasing goods and services, predominantly for poorer households. On the other hand, it explores the debate that connects financial inclusion with financial hardship and over-indebtedness. Through a series of empirical estimations, this study provides evidence that challenges the previous understanding of the effects of consumer credit on mental health. The chief message portrayed throughout this research is that access and use of consumer credit do not aggravate subjective well-being. However, over-indebtedness, measured through the consumer-debt-to-income ratio, is a strong determinant of the negative impact that consumer credit can have on households. Misuse of several consumer credit products thus motivates the need for more efficient financial education in order to boost financial literacy and acuity.

Last, this thesis contributes to the development of a nascent topic within household finance, namely household financial resilience. To begin, the author evaluates the development of the concept of household financial resilience and proposes a measure that highly correlates with the core elements of the financial resilience framework. This measure serves as a key instrument through which policymakers can channel initiatives toward improving desirable behavior that enhances households' healthy financial habits, mostly for more vulnerable agents. Likewise, research in this thesis adds to the understanding of the effects that changes in the short-term liquidity position and access to consumer credit have on households' abilities to keep

up with their short-term commitments, to create financial buffers, to raise awareness of indicators of financial hardship at an early stage and, more importantly, to enhance their likelihood of recovering from a negative life event or external financial shock. On top of that, this dissertation reports a series of econometric exercises that contribute to evaluating different methods for the estimation of probabilistic models using panel regression that account for the unobservable characteristics of individuals.

# Chapter 2

## The APR as a consumer protection policy tool: The Consumer Credit Act 1974

### 2.1 Introduction

The passing of the Consumer Credit Act 1974 (CCA74) was a pivotal moment in British financial history. For the first time, the UK government formally acknowledged the complexities retail consumers face in credit markets and attempted to better understand how individuals absorb price signals in this market.

The enactment of the CCA74 had several policy objectives. First, it finalized the process that began with the appointment of the Crowther Committee in 1968 and whose recommendations, when published in 1971, proposed the overhaul of existing and otherwise widely scattered regulation, some of it dating to usury laws decreed in the 1540s ([Crowther et al., 1971](#); [Goode, 1975](#)). Second, the CCA74 introduced a requirement for the calculation and publication of the annualized percentage rate (APR). This sought to increase the transparency in retail credit transactions and enhance the availability of information for consumers to determine the true cost of lending. A third aim was to articulate legal rights for retail consumers and address the widely held and correct perception that individual consumers were inadequately protected in retail credit markets.

The Committee of London Clearing Banks (CLCB) and the Finance Houses Association (FHA) acted as representatives of financial institutions working in retail credit markets. They were in favor of the Crowther Committee's report recommendations ([Finance Houses Association, 1971](#); [Committee of London Clearing Banks, 1971](#)). However, in resisting the introduction of the calculation and publication of

the APR, the CLCB and FHA argued that the monetary value of weekly or monthly installments was more important than was the overall cost of the credit in determining individuals' purchasing decisions. The industry bodies also argued that the APR was an incredibly complex concept whose calculation was not straightforward ([Committee of London Clearing Banks, 1972](#)), that the information the APR could disclose was too sophisticated for the average British consumer, and that the cost of its calculation would pass on to the consumer ([Crowther et al., 1971](#)). Moreover, the CLCB was particularly concerned with the effect of the new proposed legislation on the development of the credit card market and the overdrafts provided by the banks as the following quote from [Burnett \(1971\)](#) depicts:

The proposed connected lending legislation, for example, could well inhibit the development of the credit card. Again, the arguments in favor of the quotation of a “true rate of interest” are theoretically strong. In practice, enforcement of this proposal on all forms of lending would have serious repercussions in many areas, not least that of the bank overdraft.

Research in this chapter documents how in spite of their reservations, financial institutions capitulated and collaborated with the government in the specification of the formulae for the calculation of the APR. Econometric results have suggested that when the APR was widely adopted, there was a significant structural break in the relationship between prices and volumes of consumer credit. The results are robust for an array of different specifications of the model, including filtered data and 2SLS estimations. This evidence supports the view that the introduction of the APR had an effect on the decision-making process of individual consumers. This chapter builds a thorough historical narrative of the evolution of consumer credit, using as the starting point the publication of the “Crowther Report” in March 1971.

The rest of the paper is organized as follows. The next section describes the industrial organization and legal framework of the British consumer credit markets in the late 1960s. Section [2.3](#) presents the evolution of consumer credit prior to the enactment of the CCA74. Section [2.4](#) presents a novel data set of consumer credit in the United Kingdom before and after passage of the CCA74 and its summary statistics. Section [2.5](#) implements an econometric strategy to test the validity of the narrative, suggesting a structural break in the volumes of consumer lending following the APR's introduction. Section [2.6](#) estimates VAR models and calculates impulse-response functions to test the response of inflation and household savings from increases in the volume of consumer credit. The final section discusses the main results and proposes lines for future research.

## 2.2 Industrial organization and legal framework of the consumer credit industry

Deposit-accepting retail financial institutions, commonly known as *banks*, have always been part of Western-style capitalism. As institutions, they tend to be an unquestioned presence in developed economies, even though most of their customers regard these institutions' activities as a mystery. Nonetheless, they are taken for granted as part of everyday life.

In Britain, the activities of a *bank* were first typified in law with the passing of the Financial Services Act 2000. Yet these institutions remain rooted to the payment-clearing system that existed in London from the 1770s onwards. This evolved into a system in which representatives of note-issuing banks met to exchange checks, to transfer money between accounts at different institutions, and settle net positions with payments from balances at the Bank of England. The system grew into a limited liability company known as the Banker's Clearing House Ltd. (established in 1864).<sup>1</sup> The company was owned and controlled by a group of banks called the Committee of London Clearing Banks (CLCB), which offered current account facilities and money transmission services as its core business. Non-member banks wishing to compete with current account facilities could do so only by outsourcing to one of the "clearing banks." By 1900, the 10 clearing banks controlled 46% of all deposits in sterling by residents of England and Wales and by 1921, five of these banks held 97% of all deposits. British monetary authorities consented to this high degree of concentration, amenable to "gentlemen's agreements" because they considered that this system offered greater flexibility than regulation would for controlling the money supply and inflation.

A market for consumer credit developed alongside banks. Parliament first regulated a credit provision in England as early as 1545, establishing a maximum of 10% for interest payments by individuals and thus liberating commerce from the "shackles" of the Catholic Church's usury laws (Gelpi & Julien-Labruyere, 2000). Overall, however, consumer credit remained largely unregulated until 1900 when the Moneylenders Act required those supplying individual credit to register with a magistrate. The same act also granted the judiciary power to dissolve unfair agreements. A revision to this law enacted in 1927 increased the costs of registration and introduced a nominal annual interest rate ceiling of 48% that, inadvertently encouraged the growth of hire-purchase<sup>2</sup> (O'Connell, 2009b).

---

<sup>1</sup>Notable participants in the organizational ecology of British depository financial institutions included the Post Office Bank, trustee savings banks, and building societies.

<sup>2</sup>Hire-purchase was largely unregulated in England until the passing of the Hire Purchase Act



By the late 1960s and in the context of postwar affluence, organizations supplying the retail consumer credit market in the United Kingdom could be divided into two large and distinct organizational groups ([Crowther et al., 1971](#); [Goode, 1975](#); [O’Connell, 2009a](#)). The first group included the main suppliers of consumer credit, namely clearing banks and finance houses. Clearing banks offered personal overdrafts, personal loans, and credit cards. Finance houses were the primary providers of hire-purchase and credit sale agreements, largely (but not limited to) facilitating advances for motor vehicle purchases. These finance houses were excluded from accepting retail deposits while funding their operations through the money market. By the 1960s, some of them had partnered with large retailers to finance the acquisition of white goods, furniture, TVs, and other home appliances ([Bowden & Offer, 1994](#)). At the same time, some retailers had entered the consumer credit market by supplying installment credit directly to their customers. Moreover, finance houses actively sought to diversify into the provision of personal loans and revolving credit.

A second organizational group encompassed institutions that provided short- and long-term consumer lending. Financing short-term transactions included check traders (also known as Scotch drapers, tallymen, and credit drapers), credit card issuers, mail order houses, pawnbrokers, moneylenders, and mutual aid societies.<sup>3</sup> Check traders appeared at the end of the 19th century as doorstep sellers of clothing and drapery who collected repayment through weekly installments. Pawnbrokers and moneylenders represented an insignificant source of consumer credit in postwar Britain, whereas mutual aid societies encompassed different forms of association (such as credit unions) in which middle- and working-class individuals pooled resources to extend low-cost credit to their peers.

## 2.3 Evolution of consumer credit prior to the CCA74

Before the passage of the CCA74, the growth of the consumer credit market in postwar Britain was evident, although there was confusion and overlap regarding how transactions in this market were typified ([Hansard \(Lords\), 1972](#), cols. 928–77). For instance, the extension of funds and the deferment of payments for the purchase of consumer goods were considered two distinct transactions. Of greater concern was that the regulation of consumer credit spread throughout a large body of law and via a diverse collection of rules of jurisprudence ([Goode, 1975, 1979](#); [Hyde, 1974](#)). The Department of Trade and Industry then set up an inquiry committee

---

1938 and its significant revision enacted in 1954, see ([Thornely & Ziegel, 1965](#)).

<sup>3</sup>Other actors providing consumer credit were the National Giro, some small loan societies and other small lenders.

in September 1968 under the direction of Sir Geoffrey Crowther,<sup>4</sup> with a view to improving the regulatory framework of consumer credit while increasing protection for borrowers.

It is worth noting that long-term consumer credit was excluded from the remit of the inquiry and therefore is not analyzed within this chapter. Long-term lending chiefly involved mortgages for house purchases or the repair and improvement of personal dwellings through building societies, local authorities, insurance companies, and a host of brokers and dealers who engaged with individual customers on behalf of these organizations.<sup>5</sup>

Sir Royston Myles Goode, who was also a member of the Crowther Committee on Consumer Credit, argued that the Crowther Committee had identified three fundamental issues regarding the regulation of consumer credit (Goode, 1975). First, this included the regulation of transactions according to form instead of function. The latter, the report suggested, separated sale credit (deferment of payments) from loan credit (extension of funds). The second issue was the failure to distinguish between consumer and commercial transactions, and the third one was the absence of any rational policy in relation to the role and liability of third parties in a consumer credit transaction. This recommendation suggested that, although protection of borrowers was typified in English law, borrower protection was not de facto enforced, because its application relied on a host of technicalities which, in turn, and with no apparent reason, most cases often failed to meet.

The Crowther Report identified a degree of consumer inertia in buying habits (with a strong preference for financing alternatives with which they were most familiar) and that consumers would seldom shop around for better offers. All this effectively worked to increase the cost of purchases. The report also recorded that a social stigma existed in the use of consumer credit (Crowther et al., 1971). However, this seemed to be significantly less compared with that observed during the inter-war period when “like contraception or venereal disease, it became an area where secrecy, born of social stigma, bred ignorance, thus limiting consumers’ ability to make informed choices” (Scott, 2002, p. 1).

Following the publication of the Crowther Report in March 1971, a debate was initiated in June 1972 in the House of Lords. The argument in the initial statement by Phillips (1972, cols. 928–77) was as follows:

Under the present law a finance company has no obligation to show in

---

<sup>4</sup>Baron Crowther of Headingley (1907–72) was a former editor with *The Economist*.

<sup>5</sup>For a comprehensive review of the development of the building societies in the UK see (Samy, 2016). To understand the structural transformation of these institutions during the 1970s and 1980s see Boleat (2012), and how they entered the British bank markets see Bátiz-Lazo (2004).

its advertising or in any other way the cost of the service that is being operated. It is difficult for the ordinary man or woman to find out or understand for what he or she is paying when buying goods on deferred terms. The finance houses, including the banks, do not make it any easier to compare the true cost of borrowing.

Even though it took 30 months for the Crowther Report to be turned into a bill, in March 1973, the Department of Trade and Industry passed a voluntary code instructing credit intermediaries to calculate and publish the true cost of lending, expressed as an annualized percentage rate (APR) ([Department of Trade and Justice, 1973](#)), among other changes toward the improvement of consumer rights. Subsequently, in September 1973, the government published a white paper that followed the recommendations of the Crowther Committee to replace scattered regulation on consumer credit with two pieces of legislation: one addressed security in lending and the other dealt with consumer credit (*Reform of the law on consumer credit*, 1973).

The introduction of a requirement for the calculation and dissemination of the true cost of credit then became one of the core elements of the CCA74. As mentioned above, in their representations to the government through the CLCB and FHA, financial institutions were concerned that individual consumers would not understand the concept of the true cost of credit as represented by the APR. They also argued that the calculation was complex and not straightforward. Instead, they insisted, households' concern was the value of the installments and their frequency. It should be noted that the CLCB disagreed with the inclusion of overdrafts as a form of consumer credit and actively but unsuccessfully lobbied to keep them outside the proposed new legislation, as noted by [Wild \(1973\)](#):

The White Paper did little to allay the fears of the banks that the provisions of the proposed Consumer Credit Bill could bring about the demise of the overdraft system in its present form which had been recognized by customers over very many years as the most flexible and suitable form of lending available to them.

A general election took place between the introduction of the Consumer Credit Bill in the House of Commons by the Conservative government in November 1973 and its passage under a Labour government in July 1974. The fact that the bill passed swiftly through both houses of Parliament suggested a consensus on the need to reform the legal framework of the consumer credit market (*"Speed-up of Credit Bill by Parliamentary staff"*, 1974). Moreover, when enacted, this new regulatory framework covered most of the consumer credit products available to the British public at that time ([Finlay, 2009](#); [Goode, 1975](#)).

In what follows, the chapter argues that it was the innovation of requiring the calculation and dissemination of the true cost of credit through the APR, the element within the CCA74 that ultimately significantly changed the relation between prices and outstanding volumes of consumer credit. A stated objective for the introduction of a standardized measurement of the cost of credit was to reduce information asymmetries, enhance competition in the consumer credit market and, as a result, reduce the price of consumer credit so that its demand could grow ([Crowther et al., 1971](#); [Duggan, 1986](#)). Indeed, implicit in Crowther’s report is an argument in favor of reducing information asymmetries in the availability and cost of different types of consumer credit products. Because the volume of consumer credit was expected to increase, the report suggested that children (through schools) and adults should receive financial education to prevent households from experiencing undue financial stress.

Although the direct effects of greater consumer credit on the economy are unclear, there are some channels through which consumer credit might have real, long-term effects. For instance, consumer credit might affect national income by increasing the productivity of the industries that make use of it through the supply of capital and by facilitating exchange. Nonetheless, these effects are uncertain and indefinite. Savings margins might be reduced by higher demand for consumer credit because part of household savings can be allocated to liquidating the debt ([Danielian, 1929](#)).

The report disregarded the possibility that an increase of consumer credit would add to inflationary pressures. This was of particular interest, as the Bank of England was quite concerned with the positions of the German and French currencies and their effect on the pound sterling, possibly generating a substantial deficit in the UK balance of payments. As a result, these inflationary pressures were dealt with via the imposition of credit restrictions, especially on lending for consumption purposes ([Committee of London Clearing Banks, 1968](#)). Nonetheless, the Crowther Report posited that a standardized measure of the cost of credit plus sufficient financial education would yield better-informed households and that this had the potential to increase access to goods and services through the inter-temporal reallocation of income.

## 2.4 Data set and summary statistics

The main sources consulted to build the data set used in the econometric strategy included the historical archives of the Bank of England (BoE), the Finance & Lending Association (previously known as the Finance Houses Association), the United

Kingdom Quarterly Economic Accounts (UKEA), the Office for National Statistics (ONS), Nationwide Building Society, and Thomson Reuters. The sample period spanned from the first quarter of 1967, which is the earliest date for which the BoE reported lending for consumption purposes separately from lending for housing purchases, until the third quarter of 1986, which coincided with another period of regulatory change as marked by the passage of the Building Societies Act 1986 and the Financial Services Act 1986.

Prior to the CCA74, no aggregate data or reliable series of consumer credit was systematically collected in the United Kingdom. As a result, the author built a data series for the outstanding volumes of consumer credit while trying to avoid inconsistencies and measurement errors (de La Fuente, 2009; Hill & Fox, 1997; Prados de la Escosura, 2014). The pre-1975 consumer credit data were thus calculated by adding three series, namely advances by British banks to hire-purchase finance houses, retail distribution, and loans to persons (excluding house purchases). The series was then spliced with “consumer credit lending (excluding securitizations) to individuals” (that is, the post-1975 series of consumer credit readily available from the Bank of England’s electronic database). A similar process was carried out with the Finance House Base Rate (FBHR) and the Bank of England’s official rate. The FHA started publishing the FHBR in January 1970, when they argued that the movements in the Bank Rate were not any more representative of the movements of the price of consumer credit (“Bank Rate no longer guide to finance house charges”, 1970).

The data set (table 2.1) contained 79 observations ranging from 1967q1-1986q3 with information on the outstanding volumes of consumer credit as a percentage of households’ disposable income and as percentage of GDP, the nominal (Bank of England’s Base Rate spliced with FHBR) and real (accounting for inflation) interest rates, households’ disposable income as a percentage of GDP, households and non-profit institutions serving households’ savings ratio, employment, Nationwide’s UK house price index (change quarter-on-quarter), M4, inflation (RPI), and households’ consumption as a percentage of GDP.

Consumer credit on average accounted for 19.08% of households’ disposable income, ranging from 9.56 to 31.39%, during the entire period of analysis. When calculated as the percentage of GDP, this value went from a minimum of 5.16 to a maximum of 18.34%, with a mean of 10.96% of GDP. The big variation of the percentage of consumer credit across the sample, more than a threefold increase, suggested that this period witnessed a transformation of the demand and usage of consumer credit, as was supported in the literature.

The spliced nominal interest rate, used as a proxy for the price of consumer credit, observed values between 5 and 18%, with a mean of 10.68%. Because inflation, as measured by the retail price index (RPI), reached its historical high of 26.6% during the third quarter of 1975, the spliced real interest rate observed negative values during some periods (1971q1–1972q2, 1974q2–1976q3, 1977q1–1978q1, 1979q3–1980q2) and a mean close to 0 (0.90).

**Table 2.1:** Summary Statistics of whole sample CCA74

Variable	Obs	Mean	SD	Min	Max	T-test by Act
CC % income	79	19.08	6.33	9.56	31.39	-7.60***
CC % GDP	79	10.96	3.87	5.16	18.34	-4.78***
Nominal interest rate	79	10.68	3.08	5.00	18	-3.34***
Real interest rate	79	0.90	4.65	-12.72	7.72	1.18
HH income % GDP	79	57.04	2.03	53.46	61.12	-2.52***
HH consumption % GDP	79	51.26	1.15	49.12	54.34	-0.94***
Savings ratio	79	10.51	3.30	5.00	16.3	-5.31***
Employment	79	23,996	639	22,687	24,988	349.52**
House price change	78	0.61	2.89	-5.66	9.96	1.59**
M4	79	88,336	66,090	18,994	249,475	-94,484***
Inflation (RPI)	79	9.92	5.92	1.70	26.6	-4.85***

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

This table presents the summary statistics, including the number of observations, arithmetic mean, standard deviation, minimum, and maximum for the entire sample. Additionally, it reports the t-tests of the mean difference of the variables. The variables included in this table are consumer credit as a percentage of households' income, consumer credit as a percentage of GDP, the nominal (Bank of England's Base Rate spliced with FHBR) and real (accounting for inflation) interest rates, households' disposable income as a percentage of GDP, households' consumption as a percentage of GDP, households and non-profit institutions serving households' savings ratio, employment, Nationwide's UK house price index (change quarter-on-quarter), money supply M4, and inflation (RPI).

Households' disposable income as a percentage of GDP was on average 57.04% with a minimum of 53.46 and a maximum of 61.12%. Households' consumption, measured as the percentage of GDP ranged from 49.12 to 54.34%, with a mean of 51.26%. Consumer credit, households' disposable income, and households' consumption showed an abrupt decay between the end of 1974 and the beginning of 1975, with the trough occurring during the first semester of 1977. The savings ratio was on average 10.51% of disposable income, ranging from 5 to 16.3% across the sample period.<sup>6</sup>

Employment data were used in the analysis to capture significant movements in

<sup>6</sup>Additional figures for savings, inflation, income, and consumption are reported in Appendix A.2.

the income of British households. This series had an average of around 24 million people employed across the entire period, with a maximum of 25 million at the end of 1979 and a minimum of 22.7 million people 2 years later, at the beginning of 1983. The house prices index was the variable used to measure household wealth in the United Kingdom. Table 2.1 reports the quarter-on-quarter change of the index in constant 2011 prices. The average house price change in the sample was 0.61, going from -5.66 (decrease in house price index) to 9.96, with this peak occurring at the end of 1974. The evolution of this index showed significant upward movements in the value of real estate in the United Kingdom.

For the econometric strategy in section 2.5, the author used as instruments to account for the presence of endogeneity the money supply M4 and the inflation rate (RPI). M4 had a clear positive trend and consistently grew throughout the period from 19 to 250 billion pounds sterling, with an average of 88.3 billion. Inflation, as mentioned earlier, peaked at 26.6% during the third quarter of 1975, but additionally reached another (local) maximum of around 20% at the beginning of 1980. The overall minimum of this series was 1.7% in 1967q3, but another (local) minimum arose at the end of the period of analysis of 2.6%.

Visual inspection of performance suggested higher average values for all variables during the post-1974 period, except for the spliced real interest rate and for employment. Particularly interesting was that the price of consumer credit seemed to be increasing at the same time that the outstanding volume of consumer credit was increasing. This was intriguing because if consumer credit is assumed to behave as a normal good would, then there should have been a negative correlation between the price of the good and its demand.

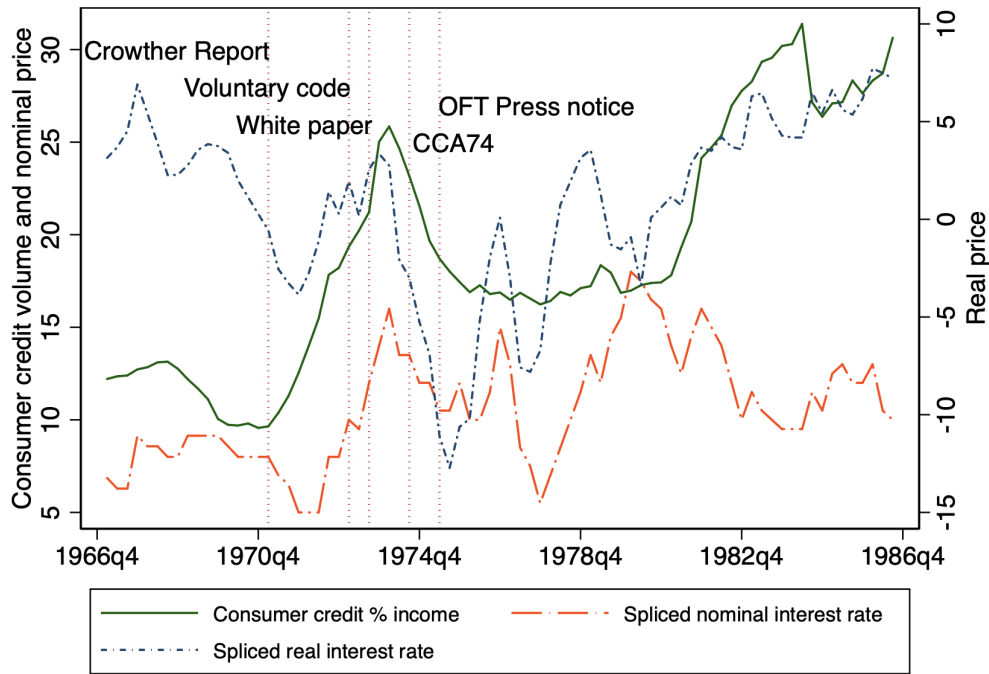
Figure 2.1 presents the evolution of consumer credit as the percentage of household income, the spliced nominal interest rate, and the spliced real interest rate. According to this figure, there was a positive correlation between the price of consumer credit, both the nominal and the real series, and the outstanding volumes of consumer credit, from the early 1970s until after the enactment of the CCA74. This relationship changed after the second half of the 1970s. This is precisely the primary channel this chapter explores. The publication of the APR would in principle contain all the relevant information regarding the true cost of lending. Assuming that consumers were able to shop around for better offers, they would also have better understood the real cost of various consumer credit products, and the law of demand should hold again.

The final column of table 2.1 reports the t-test for the mean difference of all the variables. As mentioned previously, the mean value for all the variables, ex-



cept for the spliced real interest rate and employment variable, was higher in the post-CCA74 period. According to the table, consumer credit volumes were higher after the enactment of the CCA74. In addition, there was a significant increase in both inflation and household savings. To explore the effects of the CCA74 on the outstanding volumes of consumer credit, through the calculation and publication of the APR, the next section presents the econometric strategy. Moreover, to analyze the relationship between 1) consumer credit and 2) inflation and household savings, the chapter estimated two VAR models with their correspondent impulse-response functions.

**Figure 2.1:** Volume and price of consumer credit across enactment of CCA74



Source: authors' calculations based on series from UKEA, FLA, ONS, and BoE

Note: the vertical dotted lines represent the milestone events of the passing of the CCA74, namely the publication of the Crowther Report in March 1971, the issuing of the Department of Trade and Industry's voluntary code in March 1973, the government's white paper in September 1973, the passing of the CCA74 in July 1974, and the Office for Fair Trading press notice campaign to explain the APR to credit issuers, shopkeepers, and the general audience in mid-1975.

Additionally, the author ran Augmented Dickey Fuller, Phillips-Perron, and Dickey Fuller GLS unit-root tests of non-stationarity and the KPSS test of stationarity for all series.<sup>7</sup> These tests were calculated, when possible, for the series in levels, the first difference of the series in levels, the series in logarithms, the first

<sup>7</sup>See the results in Appendix A.2.



difference of the logarithm of the series, and the filtered series. The conclusion was that the best way to eliminate the unit roots in all the series, while preserving their interpretation as simply and straightforwardly as possible, was to filter the data. Therefore, the author applied HP filters to all series; this specification is used in the next section ([Hodrick & Prescott, 1997](#)).<sup>8</sup> After testing again for the presence of unit roots, for those series that showed some evidence of non-stationarity (filtered employment and M4), the author calculated the first difference of the filtered series and used that specification instead.

## 2.5 Effects of the CCA74 on consumer credit volumes

Following economic theories of consumption-smoothing over the life cycle ([Ando & Modigliani, 1963](#); [Modigliani & Ando, 1957](#); [Modigliani & Brumberg, 1954](#)), the permanent income theory ([Friedman, 1957](#)), and theories of how households use credit to smooth their consumption over their life cycle ([Browning & Lusardi, 1996](#)), and particularly for the United Kingdom ([Hartropp, 1992](#); [del Río & Young, 2006](#)), the author estimated the following reduced form equation:

$$V_t = \alpha + \delta \text{CCA74}_t + \gamma_i P_{i,t} + \eta_i \text{Interaction}_{i,t} + \beta_j X_{j,t} + \epsilon_t, \quad (2.1)$$

where  $V_t$  is the outstanding volume of consumer credit,  $\text{CCA74}_t$  is a dummy that takes the value of one for periods equal to or greater than the third quarter of 1974, when the CCA74 was enacted, and 0 before that,  $P_{i,t}$  are the  $i$  measures for the price of consumer credit in each period (i.e., the nominal and real spliced interest rates) at time  $t$ ,  $\text{Interaction}_{i,t}$  are the interaction terms between the CCA74 dummy and the two measures of the price of consumer credit,  $X_{j,t}$  is a vector of  $j$  control variables at time  $t$ , and  $\epsilon_t$  is the error term.

The chapter estimated equation 2.1 using an OLS regression with heteroskedasticity-robust standard errors of the effects of the CCA74 on the outstanding volumes of consumer credit, measured as the percentage of households' disposable income, and in particular, through the interaction of this dummy variable with the spliced nominal and real interest rates (table 2.2, col. 1). The primary argument is that the introduction of the calculation and publication of the APR affected the relationship between price and volumes of consumer credit as a result of the reduction in the

---

<sup>8</sup>The author also ran robustness checks for all the regressions in the econometric strategy, by using the Butterworth rational square-wave filter ([Pollock, 2000](#)).

information asymmetries found in this market before the CCA74.<sup>9</sup>

Because during this period, consumer credit in the United Kingdom was arguably driven by the demand side (Hartropp, 1992), the estimations included demand-side control variables such as households' disposable income (and its first four lags), households' savings ratio (and its first four lags), the first difference (change quarter on quarter) of the employment levels, and the house price index quarter-on-quarter change (and its first four lags). Additionally, this specification also controlled for the period from the publication of the Crowther Report in March 1971, when the proposal of requiring the calculation and publication of the APR was introduced, to the enactment of the CCA74; the period of the Corset restrictions (Goodhart, 2015); and the Thatcher government period.

There is evidence of significant effects of the CCA74 on the outstanding volumes of consumer credit, through the interaction term of the CCA74 dummy variable with the spliced nominal interest rate. Moreover, the magnitude of the coefficient of said interaction (-1.5) is higher than the coefficient of the spliced nominal interest rate (1.2), both being significant at the 1% level of significance. This result suggests that after the passage of the CCA74, an increase of 100 basis points in the cost of consumer credit decreased the volumes of consumer credit by around 30 basis points, this correlation having been positive previous to this law's enactment.

The fact that the spliced nominal rate had a positive and significant coefficient, under the assumption that consumer credit is a normal good for British households, would demonstrate evidence of inefficiencies in the consumer credit market. Nonetheless, the fact that the nominal interaction had a negative sign is evidence that the relationship between consumer credit prices and the outstanding volumes of consumer credit changed significantly after the enactment of the CCA74. This is one of the principal contributions of this chapter. The introduction of the calculation and publication of the APR reduced information asymmetries in the consumer credit markets by making the prices more transparent and, therefore, the information that issuers signal to consumers.

Turning to the control variables used in this specification, the chapter found the expected signs and significance levels for most of the covariates. From the dummy

---

<sup>9</sup>Appendix A.3 contains a series of robustness checks. First, table A.3 reports the results from the most pragmatic specification, i.e., without control variables, in column (1). Then, column (2) presents the results from using the first difference of the logarithm of the variables, i.e., the percentage change. Following, column (3) depicts the results from estimating equation 2.1 without controlling for significant time periods and without including the dynamics of the independent variables. Finally, column (4) extends the results from the previous column, using 2SLS regressions. Moreover, table A.4 presents the estimations of equation 2.1 but using the Butterworth rational-square-wave-filtered data instead of the HP-filtered data (Pollock, 2000). The conclusion in all robustness checks was the same. The main results held across a broad range of specifications.

**Table 2.2:** Effect of the Consumer Credit Act 1974 (APR) on consumer credit

	(1)		(2)		(3)		(4)	
	CC % income OLS		CC % income IV		Nominal rate		Nominal intera	
CCA74	0.772	(1.290)	0.764	(1.052)	-0.250**	(0.120)	-0.200	(0.123)
Nominal rate	1.222***	(0.421)	1.196***	(0.342)				
Real rate	-0.125	(0.331)	-0.0919	(0.273)	0.999***	(0.028)	-0.116***	(0.028)
<b>Nominal Interact</b>	<b>-1.522***</b>	(0.382)	<b>-1.469***</b>	(0.315)				
Real Interact	0.315	(0.321)	0.282	(0.265)	0.137***	(0.027)	1.257***	(0.027)
Crowther	2.860***	(0.949)	2.843***	(0.784)	0.217***	(0.073)	0.0180	(0.072)
Income	1.018**	(0.459)	1.006***	(0.372)	-0.102*	(0.052)	-0.104*	(0.052)
L.Income	-0.0345	(0.551)	-0.0479	(0.448)	-0.0528	(0.063)	-0.0462	(0.064)
L2.Income	0.827	(0.562)	0.816*	(0.457)	-0.0207	(0.057)	-0.0424	(0.056)
L3.Income	0.101	(0.559)	0.124	(0.456)	-0.0348	(0.046)	-0.0247	(0.051)
L4.Income	0.775*	(0.388)	0.766**	(0.317)	0.0827**	(0.032)	0.0644*	(0.035)
Savings ratio	-0.633**	(0.293)	-0.634***	(0.238)	0.0936***	(0.031)	0.0872***	(0.032)
L.Savings ratio	-0.360	(0.300)	-0.363	(0.246)	0.0895**	(0.037)	0.0809**	(0.039)
L2.Savings ratio	-0.768***	(0.274)	-0.768***	(0.223)	0.0162	(0.033)	0.0258	(0.032)
L3.Savings ratio	-0.466	(0.317)	-0.482*	(0.259)	0.0339	(0.025)	0.0351	(0.027)
L4.Savings ratio	-0.325	(0.275)	-0.329	(0.223)	-0.0379	(0.024)	-0.0265	(0.024)
Corset	-0.241	(0.989)	-0.227	(0.809)	0.285***	(0.094)	0.239**	(0.096)
Thatcher	0.660	(1.167)	0.679	(0.948)	0.324**	(0.121)	0.286**	(0.124)
D.Employment	0.00764**	(0.004)	0.00763**	(0.003)	-0.000185	(0.000)	-0.000330	(0.000)
House price $\Delta$	-0.217*	(0.117)	-0.213**	(0.095)	-0.0428***	(0.010)	-0.0389***	(0.010)
L.House price $\Delta$	-0.0540	(0.120)	-0.0541	(0.097)	-0.0213**	(0.009)	-0.0190**	(0.009)
L2.House price $\Delta$	0.0341	(0.142)	0.0267	(0.116)	-0.00775	(0.014)	-0.00358	(0.013)
L3.House price $\Delta$	0.264*	(0.147)	0.256**	(0.120)	0.0156	(0.010)	0.00967	(0.010)
L4.House price $\Delta$	0.0312	(0.127)	0.0281	(0.104)	0.0166**	(0.007)	0.0157**	(0.007)
<b>Inflation</b>					0.851***	(0.045)	-0.171***	(0.049)
<b>D.M4</b>					-0.0000934	(0.000)	-0.000138**	(0.000)
<b>Inflation intera</b>					0.0779*	(0.041)	1.107***	(0.044)
<b>D.M4 intera</b>					0.000108	(0.000)	0.000146**	(0.000)
Constant	-1.192**	(0.466)	-1.205***	(0.388)	-0.100*	(0.050)	-0.106*	(0.058)
Observations	74		74		74		74	
$R^2$	0.686		0.686		0.997		0.996	
Adjusted $R^2$	0.533		0.532		0.996		0.994	
Hansen J p-value			0.2022					
F test p-value					0.000		0.000	

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

Column (1) presents the results of the regression of consumer credit as a percentage of households' disposable income, via OLS, on a dummy variable (CCA74) that is equal to 1 after the enactment of the law and its interaction with the spliced nominal and real interest rates. Additional control variables include the period from the publication of the Crowther Report in March 1971 to the enactment of the CCA74, households' disposable income (and its first four lags), households' savings ratio (and its first four lags), the period of the Corset restrictions, the Thatcher government period, the first difference (change quarter on quarter) of the employment levels, and the house price index quarter-on-quarter change (and its first four lags). Column (2) reports the output of the regression using instrumental variables (inflation, the first difference of M4, and their respective interaction with the dummy variable). Columns (3) and (4) depict the results of the first-stage regressions for the endogenous variables (i.e., the nominal and real interest rates) on the instruments and all the other exogenous variables.

variables defining different periods (Crowther, Corset restrictions, and Thatcher), the only period for which the levels of consumer credit were significantly higher than those of the base period, after controlling for all other variables, was the period between the publication of the Crowther Report and the enactment of the CCA74. Moreover, households' disposable income and its fourth lag had positive and significant effects on the levels of consumer credit. In contrast, the savings ratio, in accordance with the literature that argues that there is a trade-off between savings and debt, had a negative effect, significant for the contemporary value and for the value 6 months earlier, on the level of indebtedness. In line with income, an increase of 1 million employed people generated an increase of 7.64 percentage points in the volumes of consumer credit as the percentage of households' disposable income. The only variable for which the significance levels were less than expected was the change in the house price index. Furthermore, these coefficients had different signs for the contemporary value, being negative, and for the third lag, being positive. This demonstrated that changes in wealth had positive effects on consumer credit in the medium run but negative effects on the short run.

Because the main argument is that there was a structural break in the third quarter of 1974, the author ran a Chow test to provide further evidence that this was the case. To do so, the chapter estimated the following regression:

$$V_t = \alpha + \delta \text{CCA74}_t + \beta_i X_{i,t} + \gamma_i \text{CCA74}_t * X_{i,t} + \epsilon_t, \quad (2.2)$$

where  $V_t$  is the outstanding volume of consumer credit,  $\text{CCA74}_t$  is the dummy that determines the date of the potential structural break, and  $X_{i,t}$  is the set of continuous independent variables used in the previous models (i.e., the prices and demand-side variables with their respective lags). This test was run using the HP-filtered variables as before. Then the author ran an F-test on  $\delta$  and  $\gamma_i$  to see whether there was a structural break at this moment in time. The F-statistic (19,36) was equal to 14.67 with a p-value of 0.000. Therefore, the results rejected the null hypothesis that the coefficients were constant before and after the third quarter of 1974, thus providing evidence of a structural break in the series.<sup>10</sup>

---

<sup>10</sup>As a robustness check, the author ran a test of whether the coefficients in the time-series regression varied over the periods defined by an unknown break date. For this purpose, the author tested the null hypothesis of no structural break using a supremum Wald and a supremum Loglikelihood-Ratio test. The value of the former was 34.67 and of the latter was 35.24 with p-values of 0.0000. Both tests concluded that the supreme break occurred in 1975q4. This would suggest that the maximum break in the relationship between volumes and prices of consumer credit took place around a year after the enactment of the CCA74. During this period, the government campaigned heavily with credit dealers, shopkeepers, and the general audience to explain the meaning and use of the newly calculated and published APR.

A potential source of endogeneity in the estimation of the previous reduced form equation is the fact that there could have been a simultaneous causality generated from the volumes of consumer credit to the prices (spliced nominal and real interest rates). To tackle this issue, this chapter implemented a two-stage least squares (2SLS) regression, using as instruments supply-side variables. The instrumental variables used in the 2SLS regressions were the HP-filtered inflation rate and first difference of M4 (table 2.2, cols. (2)-(4)). The primary conclusion from this exercise was that the principal results still held. There was evidence of a significant effect of the CCA74 on the outstanding volumes of consumer credit through the implementation of the calculation and publication of the APR, and there was a structural break in the relationship between volumes and prices after the law's enactment. Furthermore, the results were similar to those from the estimation of the OLS model.

The first-stage regressions (table 2.2, cols. (3) and (4)) concluded that all the variables, particularly the instruments, had the expected signs and significance levels. The Angrist-Pischke multivariate F-test of excluded instruments for the first-stage regressions rejected the null hypothesis that the instruments were not yielding any useful information to explain the variation of the endogenous variables. Therefore, the relevance condition for robust instruments held for the two first-stage regressions. Moreover, the Hansen J-statistic for the over-identification test of all instruments could not reject the null hypothesis that the instruments were exogenous at any relevant level of statistical significance. Hence, the instruments offered the two desired properties of relevance and exogeneity for strong instruments.

Because the previous results seemed to be robust across different specifications, this chapter concludes that there was strong evidence that the CCA74 exhibited significant and positive effects on the outstanding volumes of consumer credit. Moreover, the channel through which this phenomenon occurred was the introduction of the calculation and the publication of the APR. This channel caused a structural break in the relationship between the outstanding volumes and prices of consumer credit. Bearing this in mind, it is worth now turning to the analysis of the effects of the increase in the volumes of consumer credit on the economy. Namely, the chapter investigates in the next section whether the increase in the volumes of consumer credit generated any inflationary pressures and/or whether this increase could have motivated households to dis-save.

## 2.6 Effects of the CCA74 on savings and inflation

Now that the chapter has provided solid evidence of a significant effect of the CCA74's enactment on consumer credit, via the APR channel, and how it changed the relationship between the price and volume of consumer credit in the United Kingdom, it is worth testing two of the main hypotheses the Crowther Committee formulated in its report. First of all, it argued that the increase in the volumes of consumer credit was not likely to generate any inflationary pressures (Crowther et al., 1971). Nonetheless, there was a strong increase in inflation just a couple of quarters after the enactment of the CCA74. Moreover, as discussed previously, even before the enactment of the CCA74, significant fear about inflationary pressures already existed, and the government was actively working to avoid any significant increases in inflation. Despite all these efforts, the highest recorded inflation rate in the history of the United Kingdom occurred precisely during this period.

Second, the Crowther Committee also argued that British households would not be provided an incentive to dis-save as a result of the cheaper access to consumer credit. On the one hand, the publication of the APR would motivate competition among credit suppliers, thus decreasing the overall price of consumer credit (Crowther et al., 1971). Given this, and according to the law of demand for normal goods, there should be an increase in the demand for consumer credit. On the other hand, even though these products could in principle substitute savings to finance consumption in the short run, households would still need to increase their savings in the future to repay these obligations. Therefore, in the long run, the savings ratio should not be affected, but households would still be able to optimize their inter-temporal consumption path through access to cheaper indebtedness.

To test the effects of an increase in the outstanding volumes of consumer credit on inflation and household savings, this chapter first sought evidence of a cointegrating relationship in two distinct settings using the Johansen VAR/VECM-based procedure. The first one, for inflation, was based on an extended Phillips-curve-type setting including the volumes of consumer credit. The specification for the effects on households' savings was based on the economic theories of consumption smoothing over the life cycle (Ando & Modigliani, 1963; Modigliani & Ando, 1957; Modigliani & Brumberg, 1954) and the permanent income theory (Friedman, 1957), again including the volumes of consumer credit. Nonetheless, there were no assumptions about the parametric setting, as vector auto-regression models (VAR) and vector error-correction models (VECM) do not assume any causal relationship between and among the variables (Canova, 2007; Hamilton, 1994; Lütkepohl, 2005). For these tests, the estimations used the data in levels as there was strong evidence that all

these series were I(1) according to the unit-root tests of section 2.4.

For the inflation specification, the optimal lag length was two lags according to four criteria.<sup>11</sup> For the households' savings specification, the optimal lag length was one lag according to the same criteria. After running all tests, this chapter found no evidence of the presence of cointegrating vectors for any of the specifications. Therefore, the chapter turned to the estimation of VAR models for the two systems of equations, using the stationary HP-filtered data. Again, using the same criteria to determine the optimal lag length resulted in the same lags as previously. The first VAR model estimated was the following (table 2.3, col. (1)):

$$Y_t = B_0 + B_1 Y_{t-1} + B_2 Y_{t-2} + U_t, \quad (2.3)$$

where Y is a matrix containing the HP-filtered values of inflation, the first difference of employment, and consumer credit as the percentage of GDP, and U is a vector containing the error term of each one of the equations. Additionally, the authors estimated Granger-causality Wald tests to analyze whether past values of any of the variables or all of the independent variables together Granger-caused the dependent variable (table 2.3, col. (2)).

The chief conclusion was that consumer credit did not show a significant result in any of the equations except in its own. Moreover, consumer credit did not Granger-cause any of the variables in the VAR, particularly inflation. The  $\chi^2$  tests for each of the equations stated that the VAR was well-specified and, overall, all lagged values of the variables were relevant to explain the contemporary variation of the dependent variables in each of the equations. Looking at the Granger-causality results, one concluded that the only variable that Granger-caused another variable during this period was the inflation rate. The drastic change in the price level seemed to have significantly affected the change in employment, but not the other way around. This suggests that the increase in inflation was caused primarily by external factors rather than by internal problems.<sup>12</sup>

---

<sup>11</sup>Final prediction error (FPE), the multivariate Akaike's information criterion (AIC), the Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC).

<sup>12</sup>In a previous version of this chapter the author considered for all exercises, the secondary banking crisis of 1973-5, and the oil price crisis of 1973. The latter had significant effects on inflation during this period. For an analysis of the secondary banking crisis, see [Scott \(1996\)](#). For a deeper insight into inflation and the oil price crisis in the United Kingdom, see [Tomlinson \(2004\)](#) and [Yergin and Stanislaw \(2008\)](#).

**Table 2.3:** VAR models and impulse-response functions of a shock in consumer credit on inflation and savings

(a)					(b)				
(1)			(2)		(3)			(4)	
VAR inflation			Granger causality chi2	Prob > chi2	VAR Savings ratio			Granger causality chi2	Prob > chi2
Consumer credit % GDP			<b>5.3774</b>	<b>0.251</b>	Consumer credit % GDP			<b>7.0400</b>	<b>0.071*</b>
L.Inflation	-0.0559	(0.037)	3.5142	0.173	L.Savings ratio	0.505**	(0.207)	5.9865	0.014**
L2.Inflation	0.0224	(0.039)			<b>L.CC % GDP</b>	<b>0.882***</b>	<b>(0.047)</b>		
LD.Employment	0.000407	(0.001)	1.4228	0.491	L.Income	-0.824**	(0.321)	6.5995	0.010**
L2D.Employment	-0.000884	(0.001)			L.Consumption	0.952***	(0.360)	7.0028	0.008***
<b>L.CC % GDP</b>	<b>1.139***</b>	<b>(0.114)</b>			Savings ratio			9.1634	0.027**
<b>L2.CC % GDP</b>	<b>-0.257 **</b>	<b>(0.114)</b>			L.Savings ratio	-0.0672	(0.499)		
Inflation			3.5096	0.476	<b>L.CC % GDP</b>	<b>-0.0195</b>	<b>(0.114)</b>	<b>0.0294</b>	<b>0.864</b>
L.Inflation	1.312***	(0.096)			L.Income	0.303	(0.774)	0.1528	0.696
L2.Inflation	-0.571***	(0.103)			L.Consumption	0.320	(0.868)	0.1359	0.712
LD.Employment	-0.00206	(0.002)	1.1141	0.573	Income			7.7248	0.052*
L2D.Employment	-0.0000801	(0.002)			L.Savings ratio	-0.452	(0.339)	1.7780	0.182
<b>L.CC % GDP</b>	<b>-0.300</b>	<b>(0.298)</b>	<b>3.0097</b>	<b>0.222</b>	<b>L.CC % GDP</b>	<b>0.0191</b>	<b>(0.077)</b>	<b>0.0609</b>	<b>0.805</b>
<b>L2.CC % GDP</b>	<b>0.445</b>	<b>(0.298)</b>			L.Income	1.169**	(0.527)		
D.Employment			17.883	0.001***	L.Consumption	-0.240	(0.590)	0.1648	0.685
L.Inflation	-6.969	(5.235)	15.835	0.000***	Consumption			33.761	0.000***
L2.Inflation	-6.565	(5.603)			L.Savings ratio	-0.301*	(0.174)	3.0062	0.083*
LD.Employment	0.220*	(0.114)			<b>L.CC % GDP</b>	<b>0.0340</b>	<b>(0.040)</b>	<b>0.7384</b>	<b>0.390</b>
L2D.Employment	0.0808	(0.107)			L.Income	0.776***	(0.270)	8.2878	0.004***
<b>L.CC % GDP</b>	<b>-2.661</b>	<b>(16.250)</b>	<b>0.4475</b>	<b>0.800</b>	L.Consumption	-0.265	(0.302)		
<b>L2.CC % GDP</b>	<b>6.698</b>	<b>(16.278)</b>			Observations	78			
Observations	76				chi2 Savings ratio	11.98**			
chi2 Inflation	387.8***				chi2 Consumer credit	413.1***			
chi2 D.Employment	56.19***				chi2 Income	81.70***			
chi2 Consumer credit	447.0***				chi2 Consumption	112.1***			

Standard errors in parentheses

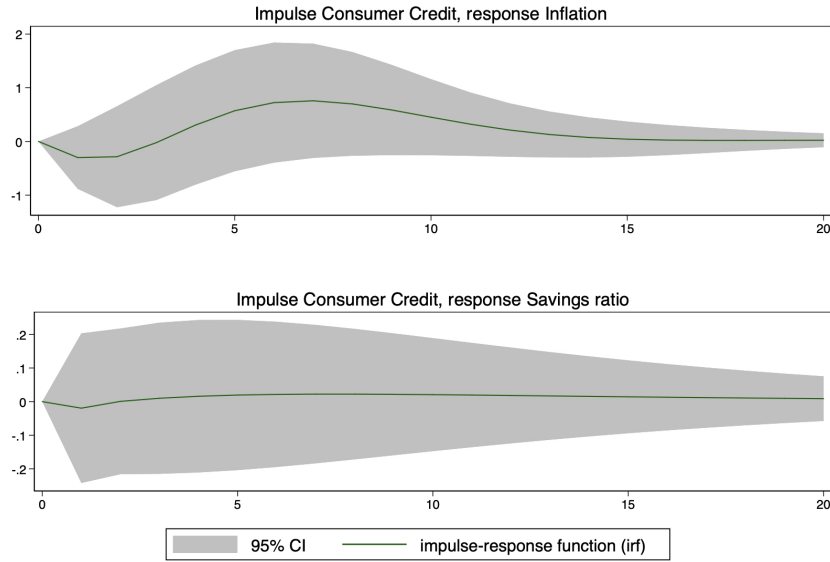
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Panel (a) presents the inflation VAR, based on an extended Phillips-curve-type setting including the volumes of consumer credit as a percentage of GDP. Column (1) reports the coefficients and standard errors for the variables and their lags in each one of the equations of the VAR, whereas column (2) reports the coefficients and p-values for the Granger-causality tests of the independent variables on the dependent variable. Panel (b) presents the savings VAR, based on the economic theories of consumption smoothing over the life cycle and the permanent income theory. As before, column (3) and column (4) report the coefficients and standard errors for the variables and their lags in each one of the equations of the VAR, and the coefficients and p-values for the Granger-causality tests of the independent variables on the dependent variable, respectively.



To further extend the analysis of the effects of the increase in the volumes of consumer credit on inflation, the chapter estimated impulse-response functions using the results from the previous VAR (figure 2.2). After inducing a temporary shock to the levels of consumer credit, the authors calculated the effect on the evolution of the inflation rate for the next 20 periods, or 5 years. As seen in the figure, the 95% confidence interval contained 0 along the entire response period, thus affirming that the effect of a temporary increase in consumer credit on the inflation rate was negligible (not statistically different from 0).

**Figure 2.2:** IRFs of a shock to consumer credit on inflation and savings ratio



Source: Authors' calculations from VAR models

Note: the figure presents the evolution of inflation (upper panel) and the savings ratio (lower panel) over a period of 5 years, after the introduction of a temporary shock in the volumes of consumer credit. The main result is that the shock to consumer credit volumes did not significantly affect inflation nor savings.

The second VAR this chapter estimated, in this case, to analyze the effects of the increase of consumer credit on households' savings was the following (table 2.3, col. (3)):

$$Y_t = B_0 + B_1 Y_{t-1} + U_t, \quad (2.4)$$

where  $Y_t$  is a matrix containing the HP-filtered values of households' savings ratio, consumer credit as the percentage of GDP, households' disposable income as the percentage of GDP, and households' consumption as the percentage of GDP, and  $U_t$  is a vector containing the error term of each one of the equations. As before, the

author ran Granger-causality Wald tests to analyze whether past values of any of the variables or all of the independent variables together Granger-caused the dependent variable (table 2.3, col. (4)).

As with the previous VAR, the main conclusion still held. Except in the equation of consumer credit, the lagged values of consumer credit were not significant in any of the VAR equations. Additionally, consumer credit did not Granger-cause individually any of the other variables. Once again, the  $\chi^2$  tests for each one of the equations showed that the VAR was well-specified and that lagged values of all the variables helped explain the variation of the dependent variables in each of the four equations. In the households' savings equation, none of the lags of the other variables were significant, nor did they Granger-cause households' savings individually, although these variables were jointly significant in the equation and altogether there was evidence that they Granger-caused the savings' ratio.

As it did earlier, the chapter analyzed the effects of the increase in the volumes of consumer credit, but this time on the households' savings ratio. To do so, the author calculated impulse-response functions first by inducing a shock to the volumes of consumer credit and then analyzing its effect on the savings ratio (figure 2.2). The effect of a shock in consumer credit on the households' savings ratio was negligible. Particularly, in this case, the 95% confidence interval was larger than before, and it also included 0 for the 20 steps, or 5 years, of analysis of the response.<sup>13</sup>

This section provided evidence that, in line with the hypotheses formulated by the Crowther Committee in 1971, the increase in the volumes of consumer credit did not contribute to generating any inflationary pressures, nor did it provide an incentive to households to reduce their savings. The main channel through which the CCA74 had a significant effect on the economy was the calculation and further publication of the APR.

## 2.7 Summary

This chapter argued that the introduction of the calculation and publication of the APR for consumer credit improved consumers' understanding of the true cost of credit and allowed consumers to shop around for better offers. Evidence supported that the introduction of the calculation and publication of the true cost of lending

---

<sup>13</sup>Figure A.3 of appendix A.3 presents additional impulse-response functions for the remaining variables in the VARs. The message from the figure is that the only variable that had a significant effect in the first VAR was inflation, affecting consumer credit and employment (first row). The second VAR concluded that consumer credit responded to a shock to savings, income, and consumption, but not vice versa (second row).

did reduce information asymmetries in the consumer credit market in the United Kingdom, which is important given their relevance in this market ([Karlan & Zinman, 2009](#)). Additionally, there was evidence of a structural break in the relationship between the volume and the price of consumer credit after the enactment of the CCA74, which suggested that households were more capable of making rational decisions about their demand for consumer credit based on the information signaled by more transparent prices.

Specifically, this chapter has answered the question “What were the economic effects of the Consumer Credit Act 1974 on the British economy?” in two steps. First, it analyzed whether there was a significant effect of the enactment of the CCA74 on the outstanding volumes of consumer credit after the introduction of the APR’s calculation and publication. Second, it tested the hypotheses that the Crowther Report enunciated in regard to the macroeconomic effects of the act, namely that any inflationary pressures would not arise due to the increase of the demand for consumer credit and that this new regulatory setting would not encourage households to dis-save.

The chapter answered this question by examining different primary and secondary sources from the British Bankers Association’s historical archives, the “Quarterly Bulletin” of the Bank of England, and articles from various newspapers and magazines from that time. In addition, it implemented an econometric strategy to assess the statistical significance of the enactment of the CCA74 to the outstanding volumes of consumer credit, using new series built on the information from the primary and secondary sources. Furthermore, the authors tested the presence of cointegration between consumer credit and inflation and household savings and estimated a series of VAR models to evaluate the effects of shocks to consumer credit on the British economy.

There were significant effects from the enactment of the CCA74 on the outstanding volumes of consumer credit via the introduction of the APR’s calculation and publication. Moreover, this chapter uncovered a structural break in the relationship between prices and the outstanding volumes of consumer credit as a consequence of this policy. Finally, the authors provided evidence to support the argument that the increase in consumer credit did not generate any inflationary pressures, contrary to what the government expected. Likewise, households did not show evidence of substituting the use of consumer credit for savings and in that sense were not motivated to dis-save. These results contribute to increasing the knowledge and understanding of some of the most volatile decades of British history, when inflation in the United Kingdom reached its historical peak. Although inflation rose during this period, at

the same time, that unemployment and economic stagnation significant worries for the country, consumer credit was not one of the catalysts or factors that worsened the political and socioeconomic environment.

Future lines of research should focus on the analysis of how households have used the APR to optimize their demand for consumer credit in recent decades when the vast increase in product availability has made it once again more difficult to make comparisons among different options. Additionally, it is important to analyze the different uses of consumer credit along the income distribution, as wealthier households are likely to make use of consumer credit for different purposes than are poorer households. Because of this, consumer credit could behave as a normal good for some households but as an inferior good for some others. Due to the aggregation of the data set in this chapter, it is not possible to disentangle these differences across households. Moreover, if households use consumer credit for purposes other than the optimization of their inter-temporal consumption path, then theories of consumption smoothing over the life cycle and the permanent income theory should be challenged and complemented.

## Chapter 3

# Consumer credit, consumption inequality, and self-reported well-being: Evidence from the BHPS and Understanding Society 1995-2013

### 3.1 Introduction

Households across the world use consumer credit daily for a wide variety of reasons. These span from smoothing big lump sum payments (e.g., consumer durable purchases or leisure expenses) across several installments, thus better matching the flows of income with the flow of expenditures; anticipating future income to optimize an inter-temporal consumption function; investing in financial assets or human capital; repaying or refinancing existing debts; mitigating negative income shocks (e.g., unemployment or illness); and even financing consumption of non-durables (e.g., services, groceries, or housing).

Academics have made considerable efforts to understand the historical evolution of consumer credit markets ([Calder \(1999\)](#); [Finlay \(2009\)](#); [Guiso and Sodini \(2013\)](#); [Hyman \(2011, 2012\)](#); [Logemann \(2012\)](#), to name a few). Additionally, authors such as [Bertola, Disney, and Grant \(2006\)](#), [Durkin, Elliehausen, Staten, and Zywicki \(2014\)](#), and [Finlay \(2009\)](#) have developed a theoretical framework for the study of the basics of consumer credit, have organized the research agenda on this topic around the most frequent themes in the literature, and have proposed future avenues

for researchers to focus on.<sup>1</sup> Moreover, studies around credit card markets have become more important and more frequently found in the literature. [Agarwal, Liu, and Souleles \(2007\)](#); [Ausubel \(1991\)](#); [Gross and Souleles \(2002\)](#); [Manning \(2001\)](#); [Nosal and Drozd \(2011\)](#); [Roberts and Jones \(2001\)](#); and [Sanches \(2011\)](#) are among the most relevant. Furthermore, the literature has explained why it is rational for households to hold high-interest debts and low-interest savings at the same time, known as the “credit card puzzle” ([Fulford, 2015](#)). Nonetheless, there is still a considerable lack of understanding of the effects of consumer credit on different types of households’ expenditures and well-being.

This chapter contributes to the literature by addressing these gaps. The purpose of this chapter is to analyze the effects of consumer credit on household expenditures and self-reported well-being, particularly focusing on how these effects vary across the income distribution. Furthermore, this chapter builds on the debate around consumption inequality ([Attanasio & Pistaferri, 2016](#)), and how it connects to the use of consumer credit ([C. Brown, 2008](#)). Additionally, the present study links the role of consumer credit in reducing consumption inequality with the effects that this can have on subjective well-being ([G. D. Brown & Gathergood, 2020](#)). Even though income and wealth inequality have been increasing since the 1980s ([Piketty, 2014](#)), household consumption has seemed to follow a different path. Moreover, consumption is closely related to utility. [C. Brown \(2008\)](#) has argued that the “savings puzzle” is evidence that households have closed the gap in consumption inequality through debt-financed expenditure. The main goal of this chapter is to evaluate the extent to which consumer credit has reduced consumption inequality in utility-generating expenditures and to determine to what extent it has been used to finance subsistence consumption, hence, not utility generating. In the same vein, the chapter studies whether consumer credit can have a positive effect on self-reported well-being when such credit increases the consumption of consumer durables and leisure goods and services, thus linking consumption and well-being along the lines of [G. D. Brown and Gathergood \(2020\)](#). Likewise, the chapter evaluates the extent to which consumer credit has negative effects on subjective well-being when it is used to finance the expenditure of subsistence consumption and when it creates some sort of financial distress (e.g., over-indebtedness).

This is a significant and relevant contribution to the literature of consumer credit for at least three reasons. First, more institutions and governments are now campaigning for financial inclusion. This means that poor households should have

---

<sup>1</sup>For a detailed review of the different aspects of consumer credit that have been studied and future research agendas, see [Kamleitner and Kirchler \(2007\)](#).

cheaper and more access to credit. Second, over-indebtedness is becoming an ever-increasing problem, even in developed economies. In a world that has lived with low interest rates for an extremely long period, increases in interest rates are more likely to arise each day, which will cause an increase in the overall cost of the debt service for households, affecting those who are already struggling to meet their payments. Finally, if the effects of using consumer credit vary across the income distribution, wealthier households might perceive the benefits of using consumer credit, whereas poorer households might be exposed to additional struggles, thus increasing inequality. Therefore, this chapter aims to provide empirical evidence of the potential of consumer credit's ability to reduce consumption inequality, at least in the short run, without having negative effects on subjective well-being.

To carry out this task, this chapter exploits longitudinal data from the British Household Panel Survey (BHPS) and from its successor, the United Kingdom Household Longitudinal Study – Understanding Society (UKHLS) (see section 3.3). The chapter uses the disaggregated structure of these data to demonstrate the effects of using consumer credit on several household expenditures and self-reported well-being across the income distribution. The household expenditures this chapter analyzes are groceries, energy, housing, meals outside the house, and consumer durables. Specifically, the chapter studies the extent to which households use consumer credit to finance leisure activities and consumer durables, and to what extent they use consumer credit for household necessities, and whether these patterns vary across the income distribution. Furthermore, the chapter analyzes the effects of using of consumer credit on household short-run and long-run self-reported well-being, based on Likert and Caseness measures. To do so, the author estimates a series of panel regressions to exploit the longitudinal structure of the data, spanning nearly 20 years. Additionally, matching-methods estimations control for the possible presence of self-selection bias in the use of consumer credit.

The estimations suggest that there are statistically and economically significant effects of using consumer credit on household expenditures. These effects vary across different types of expenditures and across the income distribution, suggesting the presence of asymmetries in the distribution of the benefits of consumer credit. There is evidence that consumer credit has the potential to reduce consumption inequality, at least in the short run, as it serves to fund the consumption of leisure goods and consumer durables, particularly for poor households. Moreover, contrary to what has been found in the literature, there was no evidence of a negative effect of using consumer credit on self-reported well-being. Nonetheless, the results suggest that the debt-to-income ratio has a negative effect on subjective well-being because it

has the potential to generate over-indebtedness and financial distress, which is in line with previous findings.

The rest of the chapter is organized as follows. Section 3.2 reviews the literature on relevant topics including the determinants of the demand of consumer credit, the relationship between consumer credit and consumption, household finance, and well-being. Section 3.3 presents the data set and methodology the chapter implements to answer the research questions. Section 3.4 describes the econometric strategy and analyzes the empirical results. Finally, section 3.5 concludes, discusses the policy recommendations derived from the results and highlights possible future extensions and research agenda.

## 3.2 Literature review

Previous studies of the demand of credit (e.g., [Browning and Lusardi \(1996\)](#); [Fulford and Schuh \(2015\)](#); and [Rubaszek and Serwa \(2014\)](#)) have mainly focused on the consumption smoothing over the life cycle ([Ando & Modigliani, 1963](#); [Modigliani & Ando, 1957](#); [Modigliani & Brumberg, 1954](#)) and the permanent income theory ([Friedman, 1957](#)). These studies model households' decisions on the basis of an inter-temporal utility maximization problem. They tend to arrive at the conclusion that households will increase their demand for long-term credit at an early stage to accumulate assets, mainly in the form of housing. These households will then decrease their indebtedness and increase their savings as their income increases and they move closer to retirement. The household decision-making process can also be affected by the internal dynamics and relations among its members ([Kirchler, Hoelzl, & Kamleitner, 2008](#)) and by behavioral and psychological factors ([Lea, Webley, & Levine, 1993](#); [Lea, Webley, & Walker, 1995](#)).

Another set of theories based on Seligman's ([1927](#)) study of the US consumer credit market and Fisher's ([1930](#)) inter-temporal consumption/investment model aim at understanding the determinants of consumer credit demand. These initial models were later adapted by [Hirshleifer \(1958\)](#) and [Juster and Shay \(1964\)](#), who introduced credit rationing to analyze why households are willing to accept high-cost credit. According to [Durkin et al. \(2014\)](#), if the rate of return of additional investments on durables is higher than the cost of the additional borrowing for the purchase of those consumer durables, but lower than the sacrifice in current consumption or decrease in savings, households are said to be constrained or rationed. This gives rise to the appearance of high-cost credit lenders that are more flexible with their loan terms than traditional financial institutions are, thus providing funds



for different sectors in the market. The main problem with these products is that they generate increases in inequality, as poorer households tend to be excluded from some types of formal credit and therefore end up paying more for accessing this market than richer households do. This is also the case because information asymmetries remain important in explaining the prevalence of credit constraints ([Karlán & Zinman, 2009](#)).

The two sets of theories tend to agree on the fact that households' socioeconomic and demographic characteristics are quite relevant in the decision-making process of the demand of consumer credit. Although consumption-smoothing-over-the-life-cycle theories focus mainly on the age and stage of life of the household, investment/consumption theories give more relevance to how household characteristics determine credit rationing and how that affects the demand for credit across the wealth distribution. [Durkin et al. \(2014\)](#) have argued that younger and poorer households are more affected by terms to maturity (size of monthly payments), whereas older and richer households are more concerned with the cost of credit (interest rates). Moreover, recent studies have implemented survey data to figure out the determinants of the demand of consumer credit for different types of households, particularly those considered riskier and more vulnerable.<sup>2</sup>

Previous researchers have used the BHPS and UKHLS to analyze the determinants of the demand of consumer credit but have not exploited the panel dimension of the survey. This chapter here discusses three of the primary studies. The first one is [del Río and Young \(2006\)](#). They estimated the determinants of unsecured borrowing using the 1995 and 2000 waves of the BHPS. To do so, they estimated the probability of using consumer credit through probit models. After that, they estimated OLS regressions to analyze the levels of unsecured debt. In their models, they have included households' demographic characteristics, financial variables, occupation, and expectations of future financial situation. The authors ran cross-section and pooled regressions with time dummies interactions. Their models explain 20–25% of the variation of the probability of usage and of the levels of consumer credit. They also ran a first differences model to explain the change in the levels of consumer credit, but the goodness of the fit of the model was even lower. This research informs the present chapter's econometric strategy because household characteristics, specially differences in wealth, can influence the effects that consumer credit has on households' consumption and self-reported well-being.

The second study used data from the BHPS and the Families and Children

---

<sup>2</sup>An example of this is [Togba \(2012\)](#) for the micro-finance sector in Côte d'Ivoire. They argue that ethnic networks are an important determinant for the demand of credit, using the 2002 cross-section of households from the Living Standards Survey.

Survey to examine the effects of housing wealth on consumer credit demand for households with children. [Bridges, Disney, and Henley \(2006\)](#) presented empirical evidence that suggests that homeowners tend to use more credit cards, whereas tenants usually rely on catalogue and mail order purchases. They also used cross-sectional data from the 2000 BHPS to determine the probability of holding a credit card, owing money on credit cards or in catalogues, or having taken out personal loans. For their estimates, the authors used information of homeownership, marital status, income, employment, education, and other demographics. Again, using their results extends the present analysis of the effects of consumer credit on consumption inequality of consumer durables and leisure and on subjective well-being.

The last one is a more recent study that uses data from the BHPS and the UKHLS to report the change in wealth from 2005 to 2013 of British households. [Broughton, Kanabar, and Martin \(2015\)](#) identified as the winners of the financial crisis the top income quintile and homeowners, as they were on average, financially better off in the post-crisis period. The losers were the bottom income quintile and the 26–35-years-olds, as their wealth was reduced, and they resorted more to the use of non-mortgage credit, thus becoming less financially resilient (see chapter 4). This chapter contributes to this literature by extending the analysis of the effects of consumer credit on household expenditures and self-reported well-being, and also by exploiting the panel structure of these surveys. Moreover, this chapter evaluates the extent to which consumer credit reduces consumption inequality, via improving the consumption of consumer durables and leisure, particularly for families at the bottom of the income distribution.

Other UK studies provide information for the distribution of assets, income, and liabilities before the financial crisis, using cross-sectional data from the NMG Research survey for the years 2005 and 2006 and compared it to the data from the BHPS in 1995 ([Barwell, May, & Pezzini, 2006](#)). They reported that shares of outstanding volumes of different components of debt (e.g., secured and/or unsecured) remained fairly stable. Moreover, they concluded that before the financial crisis, only a small number of households struggled to meet their debt repayments. These households were usually low-income households owing some type of unsecured debt. This chapter extends these results by offering an analysis of whether consumer credit decreases self-reported well-being or whether these problems arise from misusing consumer credit. Additionally, some studies have looked at both the demand and supply side of consumer credit markets. [Puri, Rocholl, and Steffen \(2011\)](#) have argued that the financial crisis had a significant negative effect on the supply of credit for banks with substantial subprime exposure, whereas the demand

for consumer credit fell similarly across all banks. This chapter contributes to this literature by extending the period of analysis to include the period of the financial crisis to demonstrate how negative shocks affected British households.

Moreover, [M. Taylor, Jenkins, and Sacker \(2009\)](#) have found that “higher financial incapability is associated with higher mental stress, lower reported life satisfaction, and health problems associated with anxiety or depression.” One of the main contributions of this chapter builds on this literature and argues that there is an important difference between access to consumer credit and overuse of said products. Therefore, this chapter evaluates the extent to which consumer credit affects households’ subjective well-being. Some studies have also found negative effects of over-indebtedness on household self-reported well-being ([Sweet, Nandi, Adam, & McDade, 2013](#); [Richardson, Elliott, & Roberts, 2013](#); [Gathergood, 2012a](#); [Bridges & Disney, 2010](#); [S. Brown, Taylor, & Wheatley Price, 2005](#); [Reading & Reynolds, 2001](#)), although these seem to be closely related to over-indebtedness rather than the access to consumer credit, even when this remark is not clarified within the studies. This chapter challenges this view by separating the effects of access to consumer credit on households’ self-reported well-being from the level of consumer credit indebtedness, measured by the debt-to-income ratios. Furthermore, it implements matching estimators to control for the possible presence of self-selection bias. The next section presents the data and methodology used to carry out the estimations.

### 3.3 Data and methodology

This chapter exploits data from several waves from the BHPS and the UKHLS. The BHPS was an annual survey carried out in the United Kingdom consisting of a stratified random national representative sample ([University of Essex – Institute for Social and Economic Research, 2010](#)). In 1991, approximately 5,500 households were recruited from the stratified clustered design taken from the Postcode Address File, totaling an estimated 10,000 individuals. These individuals were then interviewed each year until 2009. The survey followed individuals rather than households, as the latter tend to change when children leave to start their own households or when circumstances break the households apart. In 1999, 3,000 households from Scotland and Wales were included in the main sample. Finally, 2,000 households from Northern Ireland were included in 2001 as well.

After 2009, another initiative began in the United Kingdom, the UKHLS conducted by ISER ([University of Essex – Institute for Social and Economic Research, NatCen Social Research and Kantar Public \[producers\], 2016](#)). As a multi-topic

household survey, the purpose of Understanding Society is to assess the social and economic change in Britain at the household and individual levels. Understanding Society is a successor to the BHPS, and the BHPS sample forms part of Understanding Society from wave 2 onward.<sup>3</sup> Understanding Society captures important information every year about the social and economic circumstances and the attitudes of people living in 40,000 UK households. Interviews began in 2009 with all eligible members of the selected households. Adults are interviewed every 12 months either face-to-face or over the phone using computer assisted interviewing.

Specifically, this chapter uses waves 5, 10, and 15 from the BHPS, and wave 4 from the UKHLS, which represent the years 1995, 2000, 2005, and 2012–2013, respectively.<sup>4</sup> These waves contain detailed information about household and individual finances, such as use of consumer credit. Nonetheless, for some variables, the chapter recovered information from the previous year, meaning that there is also information from waves 4, 9, and 14 from the BHPS and from wave 3 from the UKHLS.

The data extracted from the different waves are divided into four categories. First, the data contained information related to consumer credit, such as ownership and use of credit or store cards, hire purchase, personal loans. The second category comprised variables related to other household and individual finances (excluding consumer credit), such as saving behavior, home ownership, and mortgages. The third category contained information corresponding to households' expenditures. This category covered consumer durables, food and groceries, meals outside the house, services, housing, and more. Finally, the data set gathered information related to socio-demographics and well-being. The following subsection examines the descriptive statistics of the main variables for the empirical exercises.

### 3.3.1 Descriptive statistics

Figure 3.1 shows the evolution of consumer credit and consumption as percentage of household disposable income and household savings at the macroeconomic level in the United Kingdom. From the graph, one can observe that from 1995 up to before the beginning of the financial crisis, both consumption (left axis) and consumer credit as a percentage of household income (right axis) were on the rise, from 87 to 99% and from 20 to 38%, respectively, whereas the savings ratio was on the decline,

<sup>3</sup>This chapter uses only information for those individuals that were interviewed both in the BHPS and UKHLS.

<sup>4</sup>This means that although the surveys contain information for Northern Ireland, this chapter includes information only for Great Britain and therefore the results are generalizable only at this level.

falling 10 percentage points from around 15 to 5% (right axis). This pattern reversed at the outbreak of the financial crisis, showing significant drops in both consumer credit and consumption and an increase in the savings ratio. After a couple of years, some mild correction in the series arose, especially for consumption and the savings ratio. This trend was similar to what is seen in the value of the individual and households' consumer-credit debt in the sample. These began at around £780 and £960 in 1995, respectively, and then increased up to £1,580 and £1,650 in 2000, kept growing to a maximum of £1,950 and £2,040 in 2000, and fell to £1,750 and £1,840 respectively, by the end of the sample period.

**Figure 3.1:** Consumption and credit as percentage of income, and savings



Note: this figure presents the evolution of consumer credit and household consumption, as a percentage of households' disposable income, and the savings ratio from 1995–2014. The vertical red line marks the outbreak of the global financial crisis, proxied by Lehman Brothers' filing for bankruptcy.

Table 3.1 presents the use of consumer credit by product and income decile for the entire sample. Column (1) of this table reports the use of any kind of consumer credit for each income decile and for the total of the sample. From this column, one observes that around 39% of respondents used at least one form of consumer credit. There was a clear trend by income deciles. Use of consumer credit started above 25%, going up to around 47% for the 8th decile and slightly declining to

43% for the top decile. This indicates the presence of important asymmetries in the access to consumer credit.<sup>5</sup> The same trend was observed for hire purchase, personal loans, and credit cards. Columns (2) to (4) describe the use of consumer credit for each one of these products. The overall message from these columns is that credit cards were preferred to any other form of consumer credit. Personal loans were used almost as frequently as credit cards were but were clearly preferred over hire-purchase agreements, which were once the most common form of consumer credit in the United Kingdom.<sup>6</sup> Column (5) reveals an interesting fact. For the entire sample period, mail order was used more frequently by households at the left of the income distribution. There is a clear decreasing trend in the use of mail-order agreements as the income decile increases.<sup>7</sup> Finally, column (6) indicates that recurring to loans from individuals was quite similar across the income distribution and accounted for between 1 and 2% of the sample. This would suggest that there were no significant differences in the access to credit from one's own social network for different income deciles.

**Table 3.1:** Households using consumer credit by product and income deciles

	(1)	(2)	(3)	(4)	(5)	(6)
	Owes	Hire purchase	Personal loan	Credit card	Mail order	From ind.
less p.10	.2583919	.0452771	.0710383	.0827479	.0999219	.010929
p.10-20	.2629108	.0492958	.07277	.099374	.1064163	.0117371
p.20-30	.3302034	.0868545	.1087637	.1220657	.1025039	.0117371
p.30-40	.3934169	.0971787	.145768	.1716301	.1034483	.0086207
p.40-50	.3943662	.0923318	.1627543	.1760563	.0892019	.013302
p.50-60	.4451411	.1073668	.1990596	.1912226	.0815047	.015674
p.60-70	.4541895	.1184314	.1764706	.2258824	.0870588	.0117647
p.70-80	.4667189	.1088489	.2153485	.2223962	.0759593	.0227095
p.80-90	.450078	.1154446	.1957878	.200468	.0577223	.0101404
p.90+	.4327301	.1093627	.1888277	.2258065	.0377655	.0133753
Total	.3887584	.093016	.1536173	.1717037	.0841685	.0129972
Obs.	12774	12772	12772	12772	12772	12772

This table presents the percentage usage of consumer credit in the sample by product (columns (1) to (6)) and by income decile (rows “less p.10” to “p.90+”), and total. Column (1) refers to the use of any kind of consumer credit product, whereas columns (2) to (6) report the data for each type of product separately.

<sup>5</sup>Even though this trend is expected, as there is a positive correlation between income and access to credit, this can be a potential source of inequality that would be worth addressing.

<sup>6</sup>See Chapter 2 of this dissertation for a deeper discussion of the history of hire-purchase agreements in the UK.

<sup>7</sup>It is important to notice the difference in the trends of different products, possibly making them substitutes rather than complements, although the sample does not allow to test if the substitutability of mail order for other types of consumer credit derived from financial exclusion.

Next, the analysis turns to household expenditures, well-being, and the debt-to-income ratio. The chapter classifies household expenditures into five groups. These are monthly groceries, monthly energy, monthly housing, monthly leisure (measured as meals outside the house), and yearly consumer durables. Unfortunately, some of the questions have changed in the survey as time elapses and, therefore, some information was missing for a few periods. The data set contained information for the 4 waves for expenditure on food and groceries and for energy (calculated as the sum of consumption of oil, gas, and electricity). There was information for housing and consumer durables' consumption for the first 3 waves, and for meals outside the house, which is the variable that proxies leisure, for the last 3 waves.<sup>8</sup> Additionally, subjective well-being was captured by the Likert and Caseness scales from the General Health Questionnaire (Goldberg, 1978) module in the sample. Likert varies from 0 to 36, whereas Caseness varies from 0 to 12 (M. Taylor et al., 2009). The former is more sensitive to short-run variation, and the latter is less sensitive to short-run variation (long-term well-being). For both variables, the higher the value, the more distressed was the respondent. Finally, the debt-to-income ratio was calculated as the value of the outstanding consumer credit debt as a percentage of household yearly income.<sup>9</sup>

Table 3.2 reports the mean and median, first and second row, respectively, of households' expenditures as a percentage of their income in columns (1) to (5), of the Likert and Caseness scales in columns (6) and (7), and of the consumer-credit debt-to-income ratio in column (8). These statistics provide useful information regarding the distribution of households' expenditures among necessity goods, consumer durables, and leisure items, which will help explain to what extend households use consumer credit to finance necessity goods or goods that could increase their utility, and whether this varies across the income distribution.<sup>10</sup> Additionally, the Likert and Caseness scales deliver information on respondentss short- and long-term well-being. Finally, the debt-to-income ratio can highlight nuances of levels of indebtedness for the average and median respondent at each decile.

Beginning with the expenditure items, one observes that for all types of expen-

---

<sup>8</sup>For further research, it would be very interesting to collect information about households' expenditure on tourism. The reason for this is that there might be different patterns in households' expenditures for different types of leisure goods, and tourism can take a significant share of households' expenditures.

<sup>9</sup>One important caveat is that the average age in the sample ranges from 41 to 57 years. This is because participants had to be interviewed in each one of the waves during the 20-year period, time during which they had to be older that 16 years and alive for each one of the waves.

<sup>10</sup>Unfortunately, there were no data for consumer durables expenditure for the last wave, so one cannot analyze how this was affected by the financial crisis. Nonetheless, this still remains one of the most important purchases for which households use consumer credit.



ditures, the average value decreased as the income decile increased. This is in line with what was expected because for lower incomes, families usually assign a higher portion of their resources to subsistence goods and services, particularly food. Moreover, the mean and median value for groceries and energy remained rather close, suggesting that there were no major intra-decile differences. For the first 2 deciles of housing expenditure, the median value was equal to 0, which could evidence subsidies for housing costs to low-income families. Nonetheless, for the rest of the income deciles, the mean and median seemed to converge. Leisure expenditure was the item with the lowest difference across income deciles. This could signal households behaving similarly, at least with consumption of meals outside the house, in their demand for leisure. The last expenditure, reported in column (5), revealed some interesting nuances in the consumption of consumer durables across the income distribution. Although the mean value was decreasing, the median value for this item was equal to 0 for the first 3 deciles, meaning that less than half of the members of said groups reported spending money on durables during the year prior to the interview. Additionally, for the rest of the income groups, there was a particular trend for the median value. First, it increased up to the eighth decile, and then it decreased. Clearly, this expenditure behaved differently from the other items. Likewise, there was a significant difference between the mean and median value, highlighting important intra-decile differences. For each group there were households spending considerably more on these goods than the median respondent did, thus positively skewing the distribution.

Next, the subjective measures of well-being in columns (6) and (7) contained a similar message. There was a decreasing trend in the mean value of both scales, across the income distribution, which would suggest a correlation between low income and mental distress, although it is difficult to tell whether this difference was statistically significant. However, the median value seemed to be rather similar for most deciles, except for the first few. Finally, the last column of table 3.2 contains the debt-to-income ratio's mean and median. Table 3.1 showed that no single group had a percentage of consumer credit use of more than 50%, hence the median value of 0 for all groups. However, it is thought-provoking to note that there was no clear trend in the mean of this variable, and rather, one observed oscillating values between approximately 4 and 7%, with the highest value for the first decile and the lowest value for the top decile. The values presented in this table differed slightly from the values observed in figure 3.1. It is possible that the variables at the aggregated level were calculated slightly differently from what this chapter did. In addition, it could be that volumes of consumer credit tend to be lower for re-



spondents in the sample than for the general population due to the stage of the life cycle at which the respondents were in each wave. Additionally, there might be a systematic under-reporting of these values, as households do not tend to reveal the true values of financial variables.<sup>11</sup>

**Table 3.2:** HH XP, well-being, and debt-to-income ratio by income deciles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groceries	Energy	Housing	Leisure	Durables	Likert	Caseness	CC / inc.
less p.10	34.40833	7.547169	16.82246	4.351588	22.24616	12.01148	2.245902	6.683889
	29.85831	6.787779	0	2.239501	0	11	1	0
p.10-20	21.55014	4.271573	10.44634	2.846955	15.29988	11.64753	1.997575	4.052351
	19.75402	3.947425	0	2.02146	0	11	0	0
p.20-30	17.50543	3.373489	10.0255	2.605019	14.75025	11.34776	1.862981	4.645315
	15.93254	3.104929	7.854433	1.644556	0	10	0	0
p.30-40	15.33272	2.750435	9.761136	2.419009	13.15452	11.54888	1.966346	5.841957
	14.34707	2.558018	8.667933	1.76195	.5407837	11	0	0
p.40-50	13.47969	2.359102	9.389239	2.212037	12.28581	11.24223	1.921912	5.255036
	12.56941	2.191296	8.87574	1.53213	1.269033	10	0	0
p.50-60	11.99508	2.03303	9.739409	2.10446	11.29098	11.09585	1.755591	5.527133
	11.19753	1.945193	8.959495	1.490468	1.725176	10	0	0
p.60-70	10.44891	1.811653	9.408024	1.91826	10.29705	10.8576	1.7064	4.628086
	9.732716	1.664776	8.674954	1.449215	2.195613	10	0	0
p.70-80	9.498332	1.528816	8.436592	1.669651	8.859344	10.7456	1.632	4.954564
	9.146924	1.447724	7.808506	1.258011	2.703823	10	0	0
p.80-90	8.659766	1.351563	7.920191	1.592514	8.247718	10.89562	1.743426	4.260862
	8.342632	1.322358	7.231191	1.199742	1.869212	10	0	0
p.90+	6.283384	1.001142	7.79513	1.295298	7.292383	10.84261	1.718601	3.630959
	5.910429	.8787146	6.777738	1.101222	1.768624	10	0	0
Total	14.912	2.795286	9.96515	2.299856	12.35698	11.22072	1.853844	4.948568
	11.90749	2.021205	7.732516	1.472466	.9721863	10	0	0
Obs.	12741	11701	9543	9556	9466	12473	12473	12615

This table presents the mean and median values for each one of the variables in columns (1) to (8), across the income deciles in rows “less p.10” to “p.90+”, and the total sample. Columns (1) to (5) correspond to households’ expenditures on subsistence, leisure, and consumer durables. Columns (6) and (7) report the self-reported well-being of individuals, whereas column (8) contains the consumer-debt-to-income ratio, measured as the outstanding consumer credit as a percentage of the household’s yearly income.

The next section describes the econometric strategy that this chapter implemented to analyze whether consumer credit has improved household consumption

<sup>11</sup>By 2018, the level of consumer credit as percentage of income in the UK had recovered to the pre-crisis levels. This is due to the fact that volumes of consumer credit have been growing at a rate of 10% per year on average, a much higher rate than the increase in salaries.

of utility-generating goods and services, and self-reported measures of well-being, and presents the results of the empirical exercises.

## 3.4 Econometric strategy

### 3.4.1 Effect of consumer credit on household expenditures

The main objective of this chapter is to estimate the effects of consumer credit on household expenditures for several goods and services and on the self-reported measures of well-being. Moreover, this chapter analyzes the extent to which these effects vary across the income distribution. Specifically, it first aims at understanding the extent to which poorer households use consumer credit to finance subsistence and necessity goods, such as groceries, energy, and housing, and to what extent they use consumer credit to finance leisure goods and consumer durables. The underlying assumption is that an increase in the consumption of leisure and consumer durables results in higher household utility, but an increase in the expenditure on subsistence or necessity goods does not increase said utility significantly. Therefore, if poorer households use consumer credit mainly for subsistence and necessity goods, whereas wealthier households use it for leisure expenditures and consumer durables purchases, then one can argue that there are asymmetries in the use of consumer credit that increase consumption inequality. Second, the chapter evaluates whether consumer credit has negative effects on household self-reported well-being, measured with scales that reflect the likelihood of a respondent being distressed. If there are significant effects, one would want to know whether these vary across the income distribution and whether poorer households are more likely to become distressed for using consumer credit than are wealthier households.

To carry out this task, this chapter estimates a series of panel regressions that take the following form:

$$\frac{Y_{it}}{m_{it}} = \alpha_i + \beta D_{it} + \gamma \frac{CC_{it}}{m_{it}} + \theta_k \text{p.m}_{i,k,t} + X'_{it} \Lambda + \pi_j R_j + \phi_{n,l} T_{n,l} + \epsilon_{it}, \quad (3.1)$$

where  $\frac{Y_{it}}{m_{it}}$  is the household's expenditure as a percentage of their income, on groceries, energy, housing, leisure, and consumer durables. The coefficient  $\alpha_i$  accounts for the household's fixed effects.<sup>12</sup>  $D_{it}$  is a dichotomic variable that determines

---

<sup>12</sup>The author ran Hausman tests for each one of the specifications and equations estimated in this chapter, and for all of them the conclusion of the test was to reject the null hypothesis that the coefficients of the fixed effects and random effects models were not systematically different.

whether household  $i$  owes money in any consumer credit product at time  $t$ . Therefore, the main coefficient of interest is  $\beta$ . There is also interest in  $\gamma$  because  $\frac{CC_{it}}{m_{it}}$  is the consumer credit debt-to-income ratio and captures whether high levels of debt (i.e., over-indebtedness) affect households' expenditures across different goods and services. The set of variables  $p.m_{i,k,t}$  contains the information about the income decile  $k$  to which each household  $i$  belongs at time  $t$ . These variables reveal the nuances of households' expenditures across the income distribution. Next,  $X_{it}$  is a matrix of observed time-varying covariates, including whether the household has investments and the logarithm of their value, whether the household saves and the savings ratio, the logarithm of current household's income, the logarithm of household's income the year before, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, and the highest academic qualification. Finally,  $R_j$  are the region fixed effects,  $T_{n,l}$  are the month and wave of survey time effects, and  $\epsilon_{it}$  is the error term.<sup>13</sup>

Table 3.3 presents the results of these estimations. Column (1) reports the results for monthly groceries, column (2) for monthly energy, column (3) for monthly housing, column (4) for monthly leisure, and column (5) for yearly consumer durables expenditures. All expenditures were calculated as a percentage of the household's income (monthly for the first four items, and yearly for consumer durables). The first striking thing was that having outstanding consumer credit only had a statistically significant effect at the 1% level for groceries expenditures. The effect was negative and indicates that the average household that used consumer credit spent 0.51 percentage points (pp) less on groceries than households without outstanding consumer credit debt.<sup>14</sup>

Next, the consumer credit debt-to-income ratio, measured as "CC % HH income," had a positive and significant effect on groceries, housing, and meals outside the house but not on energy or consumer durables. These coefficients indicate that as households increased their level of indebtedness by 1 pp, their expenditures increased on groceries by 0.02 pp (at the 5% level of significance), on housing<sup>15</sup> by 0.04 pp (at the 5% level), and on leisure<sup>16</sup> by 0.01 pp (at the 1%). These results already suggest that households used consumer credit to finance necessity goods like groceries and housing but also leisure goods, like meals outside the house.

---

Therefore, the article estimated all models using fixed effects to obtain consistent coefficients. Nonetheless, it is important to remember that this specification does not allow the inclusion of time-invariant variables.

<sup>13</sup>The coefficients of the control variables are available upon request.

<sup>14</sup>The mean and median groceries expenditure were 14.91% and 11.91%, respectively (table 3.2)

<sup>15</sup>The mean and median housing expenditure were 9.97% and 7.73%, respectively (table 3.2).

<sup>16</sup>The mean and median expenditure on leisure were 2.30% and 1.47%, respectively (table 3.2).

**Table 3.3:** Effect of consumer credit on HH expenditure

	(1)	(2)	(3)	(4)	(5)
	Groceries	Energy	Housing	Leisure	Durables
Owes money	-0.507*** (0.176)	0.0150 (0.061)	-0.396 (0.310)	-0.0441 (0.081)	0.775 (0.793)
CC % HH income	0.0194** (0.009)	0.00264 (0.003)	0.0373** (0.017)	0.0111*** (0.003)	0.0591 (0.039)
log HH income	-12.80*** (0.803)	-2.899*** (0.211)	-5.286*** (1.285)	-2.573*** (0.319)	-8.140*** (2.729)
log HH income t-1	0.332* (0.188)	-0.0272 (0.063)	0.795** (0.348)	0.176** (0.076)	0.801 (0.800)
Income decile (Baseline: less than p.10)					
p.10-20	-6.354*** (0.706)	-1.538*** (0.221)	-3.560*** (1.216)	0.0229 (0.287)	-5.274** (2.647)
p.20-30	-8.461*** (0.890)	-1.793*** (0.254)	-4.253*** (1.517)	0.0690 (0.350)	-5.716* (3.266)
p.30-40	-8.892*** (1.035)	-1.860*** (0.299)	-5.850*** (1.790)	-0.0684 (0.402)	-7.418* (3.855)
p.40-50	-9.262*** (1.177)	-1.884*** (0.333)	-6.315*** (2.001)	0.336 (0.463)	-7.238* (4.226)
p.50-60	-9.535*** (1.290)	-1.657*** (0.366)	-6.899*** (2.188)	0.310 (0.508)	-9.810** (4.645)
p.60-70	-8.809*** (1.403)	-1.379*** (0.395)	-7.496*** (2.372)	0.453 (0.552)	-9.224* (5.023)
p.70-80	-8.420*** (1.523)	-1.210*** (0.429)	-7.813*** (2.589)	0.461 (0.606)	-10.88** (5.474)
p.80-90	-7.678*** (1.677)	-0.860* (0.471)	-7.624*** (2.808)	0.876 (0.665)	-11.00* (5.994)
more p.90	-5.864*** (1.947)	-0.213 (0.538)	-8.696*** (3.198)	0.905 (0.771)	-10.28 (6.872)
Constant	122.3*** (6.042)	29.95*** (1.772)	55.34*** (9.942)	22.38*** (2.256)	94.95*** (22.435)
Observations	11245	10384	8407	8538	8340
R <sup>2</sup> (within)	0.635	0.472	0.242	0.257	0.0862

Robust standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the estimations of equation 3.1 using fixed-effects panel regressions of households' expenditures on usage of consumer credit, the household's consumer-debt-to-income-ratio, households' income and its first lag, household's income decile, and a set of control variables. The control variables include whether the household has investments and their value, whether the household saves and the savings ratio, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, and the highest academic qualification. Additionally, the regressions controlled for region fixed effects and month and wave of survey time effects.

Looking at the differences in expenditure patterns across the income distribution, one notices that these varied with changes in income, except for leisure. For groceries and energy, the change in income group depicted a u-shape pattern, whereas for housing and consumer durables, the pattern seemed to be linear. For groceries, households in the second decile spent 6.35 pp less on groceries than households in the first decile (at the 1 % level of significance). This coefficient decreased to 9.53 pp less for the sixth decile, and then increased up to 5.86 pp less for the top decile. In energy expenditures,<sup>17</sup> the pattern went from 1.54 pp less for households in the second decile, down to 1.89 pp less for the fifth decile, and then up to 0.86 pp less

<sup>17</sup>The mean and median expenditure on energy were 2.80% and 2.02%, respectively (table 3.2).

for the ninth decile, at the 10% level of significance.<sup>18</sup> For housing expenditures, the richer the household, the lower was its housing expenditure as income share. This coefficient went from 3.56 pp less for households in the second income decile to 8.70 pp less for households in the top decile (all coefficients significant at the 1% level). For consumer durables,<sup>19</sup> there was a similar pattern that began at 5.27 pp less for households in the second income decile down to 11 pp less for the ninth decile.<sup>20</sup>

The within  $R^2$  was 63.5% for groceries, 47.2% for energy, 24.2% for housing, 25.7% for leisure, and 8.6% for consumer durables. Robustness checks, not reported here, used the information for the prices of each one of the expenditure items observed in figure 3.2 instead of the wave fixed effects, but the results were not altered. Another robustness check ran estimations for housing and consumer durables expenditures by first calculating panel regression probits to determine the probability of a household spending money on any of these items. Subsequently, the inverse Mills ratio was included in the regressions to control for the possible presence of self-selection bias because there was a considerable portion of households for which these expenditures were equal to zero. Once again, the main results were robust to the changes in the specification.

The next exercise this chapter carried out was running a set of panel regressions as before, but now disaggregating consumer credit by each product. These products were hire-purchase agreements, personal loans, credit and store cards, mail order purchases, and loans from other individuals. The primary objective of this set of regressions was to determine how households used different alternatives to finance several household expenditures. The results of this exercise are reported in table 3.4.

The crucial fact to note, is that the results for using consumer credit differed somewhat from before. For groceries, there was still a negative and significant effect. Households that used personal loans spent 0.54 pp less of their income on this expenditure (significant at the 1% level). Additionally, households that accessed credit from other individuals also spent less on groceries, 1.15 pp less (significant at the 10% level). Moreover, for each expenditure item, there was at least one type of consumer credit that had a statistically significant effect. This suggests that using more than one consumer credit option could have had opposite effects on households' expenditures and therefore could have canceled each other out when aggregated.

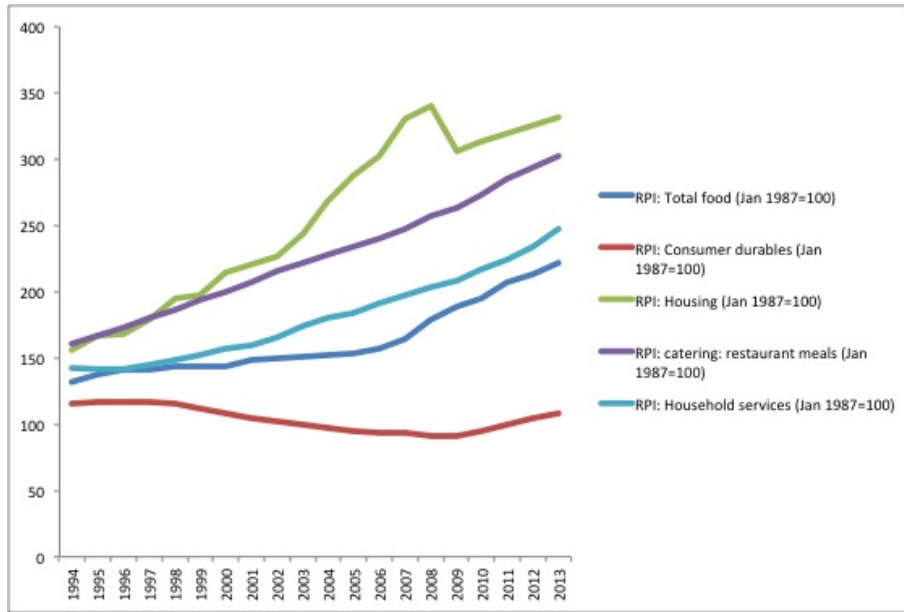
---

<sup>18</sup>The coefficient for the top decile was not statistically different from zero.

<sup>19</sup>The mean and median consumer durables expenditures were 12.36% and 0.97%, respectively (table 3.2).

<sup>20</sup>In this case, the significance varied between 5% and 10% for different income deciles, and there was no statistical significance for the coefficient of the top decile.

**Figure 3.2:** RPI indices for different expenditure items



Note: this figure presents the evolution of the price indices for the expenditure items analyzed in the econometric exercises.

The coefficients for all types of consumer credit, except for mail order in column (2), and hire-purchase agreements in column (5), were negative. Households with outstanding credit and store card balances spent 0.25 pp less on energy (1% level of significance), whereas those that used mail order agreements spent 0.19 pp more on this item (10% level of significance). Households that owed money in personal loans spent 1.27 pp less of their income on housing (significant at the 1% level). This could signal that households that had access to this kind of loan were overall better off than households that did not have this opportunity, rather than this being a causal effect of the loans themselves. For leisure expenses, households with positive credit or store cards balances spent 0.16 pp less of their income on this item (significant at the 10% level), compared with those that did not use these cards. Finally, as expected, hire-purchase agreements had an economically and statistically significant and positive effect on consumer durables consumption. Households that used these contracts spent 5.38 pp more purchasing consumer durables than did households that did not owe money on these agreements. Moreover, it is quite important to note that households that used mail order spent, on average, 2.17 pp less on consumer durables. Because households that used hire-purchase and mail order agreements had different income profiles, one can argue that there was evidence of distributional effects of consumer credit on households' expenditures.

**Table 3.4:** Effects of disaggregated consumer credit on HH expenditures

	(1)		(2)		(3)		(4)		(5)	
	Groceries		Energy		Housing		Meal outside		Durables	
Hire purchase	0.123	(0.219)	0.0906	(0.075)	0.271	(0.389)	0.0318	(0.117)	5.377***	(1.225)
Personal loan	-0.540***	(0.193)	-0.0789	(0.065)	-1.265***	(0.374)	0.0868	(0.101)	0.262	(0.988)
Credit card(s)	-0.253	(0.181)	-0.249***	(0.066)	0.472	(0.360)	-0.158*	(0.090)	0.430	(0.956)
Mail order	-0.312	(0.296)	0.186*	(0.100)	-0.489	(0.474)	-0.102	(0.128)	-2.165*	(1.262)
Loans from ind	-1.148*	(0.637)	0.207	(0.207)	-1.115	(1.173)	0.292	(0.282)	1.275	(3.020)
CC % HH income	0.0212**	(0.009)	0.00443	(0.003)	0.0451**	(0.018)	0.0101***	(0.004)	0.0352	(0.043)
log HH income	-12.80***	(0.801)	-2.887***	(0.210)	-5.287***	(1.279)	-2.577***	(0.321)	-8.344***	(2.689)
log HH income t-1	0.332*	(0.189)	-0.0268	(0.063)	0.785**	(0.346)	0.177**	(0.077)	0.680	(0.800)
Income decile (Baseline: less than p.10)										
p.10-20	-6.343***	(0.705)	-1.538***	(0.220)	-3.544***	(1.210)	0.0204	(0.287)	-5.262**	(2.633)
p.20-30	-8.456***	(0.887)	-1.791***	(0.253)	-4.251***	(1.509)	0.0631	(0.351)	-5.712*	(3.235)
p.30-40	-8.889***	(1.031)	-1.848***	(0.299)	-5.841***	(1.779)	-0.0723	(0.402)	-7.265*	(3.818)
p.40-50	-9.255***	(1.172)	-1.870***	(0.332)	-6.271***	(1.988)	0.332	(0.464)	-7.060*	(4.178)
p.50-60	-9.526***	(1.284)	-1.646***	(0.365)	-6.817***	(2.174)	0.303	(0.509)	-9.670**	(4.585)
p.60-70	-8.804***	(1.397)	-1.365***	(0.393)	-7.435***	(2.358)	0.452	(0.553)	-9.075*	(4.961)
p.70-80	-8.392***	(1.517)	-1.198***	(0.428)	-7.725***	(2.572)	0.451	(0.607)	-10.51*	(5.407)
p.80-90	-7.673***	(1.671)	-0.854*	(0.469)	-7.562***	(2.790)	0.866	(0.666)	-10.69*	(5.919)
more p.90	-5.832***	(1.940)	-0.195	(0.537)	-8.627***	(3.177)	0.899	(0.773)	-9.857	(6.783)
Constant	122.1***	(6.033)	29.87***	(1.769)	55.22***	(9.908)	22.42***	(2.270)	96.59***	(22.218)
Observations	11244		10384		8406		8538		8339	
R <sup>2</sup> (within)	0.635		0.473		0.245		0.258		0.0910	

Robust standard errors in parentheses, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the estimations of equation 3.1 using fixed-effects panel regressions of households' expenditures on the use of each type of consumer credit, the household's consumer-debt-to-income-ratio, households' income and its first lag, household's income decile, and a set of control variables. The control variables include whether the household has investments and their value, whether the household saves and the savings ratio, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, and the highest academic qualification. Additionally, the regressions controlled for region fixed effects and month and wave of survey time effects.

As before, the debt-to-income ratio had a positive and significant effect on consumption of groceries, housing, and meals outside the house but not on the rest of items. Moreover, differences in the pattern of consumption across the income distribution remained stable for all deciles and expenditure items. One can still see the u-shaped pattern for groceries and energy, with households around the median farther away from households in the first decile and in the top decile. Likewise, there was a linear pattern for housing and consumer durables expenditures, where the wealthier households spent a lower share of their income on each one of these expenses. The magnitude and significance of these effects remained quite similar to



the ones reported in table 3.3. Moreover, the coefficients, signs, and significance of the control variables in this set of estimations, although not reported here, did not differ from before, suggesting that the results were again robust to changes in the specifications of the equations.

Moving onward the chapter now interacts the variables for each one of the types of consumer credit with the dichotomic variables that determine the income deciles. This allows one to evaluate the effects of using different products on the expenditure items across the income distribution. This set of coefficients informs about the presence of distributional effects of the use of consumer credit and whether they affect consumption inequality.

The results for these estimations are presented in table 3.5. The first group of coefficients shows the differences in household expenditure by income decile. Most of the results from table 3.4 still held. The u-shaped pattern for consumption of groceries and energy was still present. As households moved up the income distribution, their expenditure on groceries decreased, up to the sixth decile (9.01 pp less), and then increased again up to the top decile, which was 5.29 pp less than the baseline case (1% level of significance). Energy consumption went from 1.35 pp less for the second decile, down to 1.65 pp less for the fifth decile, and then up again to 1.03 pp less for the eighth decile (the results were not significant for the top 2 deciles). For housing expenditures, the author found that households in the second decile spent 3.09 pp less of their income on this item than did the poorest households (5% level of significance), and this difference expanded up to 7.73 pp less for households in the top decile. There was no difference for expenditures on leisure, except for households in the ninth decile, which spent 1.26 pp more of their income on this item (10% level of significance). The principal difference from previous results was that the significance of the coefficients for each income decile group on consumer durables expenditure was considerably reduced, suggesting that the differences among groups were driven by the access to hire-purchase agreements.

To assess whether that was the case, one has to look at the coefficients and significance of the hire-purchase variable and add it to the coefficient of the interaction by income decile group. Having access to hire-purchase agreements had a significant and positive effect, which varied across the income distribution, for expenditures on monthly groceries and consumer durables but not for the rest of the items. It is important to take into account that as the sign of the coefficient of owing money on hire purchase is opposite to the sign of the interaction of this variable and the income deciles groups, these effects cancel each other out for some groups. For grocery expenditures, access to hire-purchase agreements created a difference in household



expenditures, 4.71 pp higher at the 5% level for households using this product in the first decile and then lower for the other income decile groups. More importantly, for consumer durables, having access to hire-purchase agreements increased the level of consumption of these goods for the lower income deciles more than for the higher income deciles, thus suggesting a reduction in consumption inequality. This was because these products can help poorer households to smooth their inter-temporal consumption path more than hire-purchase agreements do for wealthier households.

The next product the table reported was personal loans. Having access to personal loans did not seem to have had a significant effect on household expenditures for households in the first income decile for any of the expenditure items (before it suggested a negative effect on grocery purchases and housing, for the average household). Nonetheless, looking at the difference in the effects across the income distribution, one found that households in the second and top income deciles with outstanding personal loan debt spent more on consumer durables (at the 5 and 10% level of significance) than did households in the first decile using these products. This suggests that households in the lowest decile instead do not have access to these formal loans, as suggested in the descriptive statistics, or even those households in the first income decile that have access to personal loans do not benefit from higher consumption levels.

Households with positive credit card debt in the first income decile spent more on housing and leisure. It is worrisome that credit cards were used for necessity goods such as housing (7.86 pp more of the income for the poorest households) compared with a significantly lower expenditure on this item with this product across the income distribution—between 6.39 pp to 9.33 pp less of the household income for different income decile groups (significant at the 1% and 5% levels). It is important to notice that this effect was significant only at the 10% level for the second decile, and it was not significantly different for the third decile. This suggests that the poorest 30% of the population, of which around 10% owe money on credit and store cards, used these products to finance regular expenditures. This is evidence that credit cards did not increase households' utility, because they were used for necessity goods and services. Nonetheless, one found that leisure expenditure, households in the lowest decile allocated 1.20 pp more of their income to this item (although the significance was only at the 10% level). This result was similar for households in the third and fourth deciles but significantly lower for households in the second decile and in groups above the median. This suggests that credit cards also increased households' utility for the lowest income groups. One would have to know whether households that increased their housing expenditures were the same households that

increased their leisure expenditures with credit and store cards. For now, one can argue that credit cards had a significant effect on household consumption, even though these effects might be mixed.

**Table 3.5:** Distributional effects of different consumer credit on HH expenditure

	(1)	(2)	(3)	(4)	(5)
	Groceries	Energy	Housing	Meal outside	Durables
Income decile (Baseline: less than p.10)					
p.10-20	-5.889*** (0.746)	-1.345*** (0.236)	-3.086** (1.299)	0.319 (0.301)	-4.864* (2.880)
p.20-30	-7.825*** (0.913)	-1.574*** (0.264)	-4.353*** (1.585)	0.223 (0.361)	-5.755* (3.374)
p.30-40	-8.367*** (1.051)	-1.633*** (0.308)	-5.463*** (1.855)	0.174 (0.411)	-6.634* (3.939)
p.40-50	-8.876*** (1.187)	-1.651*** (0.342)	-5.450*** (2.058)	0.486 (0.471)	-3.993 (4.276)
p.50-60	-9.076*** (1.303)	-1.394*** (0.371)	-6.056*** (2.239)	0.671 (0.513)	-6.790 (4.656)
p.60-70	-8.364*** (1.411)	-1.052*** (0.399)	-7.096*** (2.422)	0.844 (0.557)	-5.810 (4.979)
p.70-80	-8.065*** (1.532)	-1.028** (0.431)	-7.030*** (2.637)	0.797 (0.610)	-6.499 (5.370)
p.80-90	-7.224*** (1.687)	-0.605 (0.472)	-6.913** (2.848)	1.261* (0.670)	-7.468 (5.866)
more p.90	-5.280*** (1.967)	0.0499 (0.539)	-7.728** (3.261)	1.256 (0.780)	-7.891 (6.714)
Hire Purchase	4.712** (2.077)	0.368 (0.590)	3.271 (3.699)	0.490 (1.407)	21.47** (8.776)
Interaction "Hire Purchase" & "Income decile" (Baseline: HP & less than p.10)					
HP × p.10-20	-5.216** (2.461)	0.0323 (0.703)	-0.527 (4.204)	0.960 (1.407)	-6.682 (9.711)
HP × p.20-30	-3.770 (2.297)	-0.294 (0.633)	-1.857 (3.882)	0.272 (1.459)	-6.319 (9.611)
HP × p.30-40	-5.911*** (2.125)	-0.0422 (0.663)	-3.711 (3.821)	-0.604 (1.426)	-7.152 (9.697)
HP × p.40-50	-4.731** (2.131)	-0.355 (0.604)	-4.365 (3.711)	-0.350 (1.415)	-19.26** (9.096)
HP × p.50-60	-4.726** (2.126)	-0.490 (0.602)	-2.969 (3.742)	-0.615 (1.426)	-21.47** (9.106)
HP × p.60-70	-4.243** (2.115)	-0.336 (0.595)	-3.721 (3.796)	-0.643 (1.420)	-22.25** (9.081)
HP × p.70-80	-4.449** (2.105)	0.0941 (0.625)	-3.039 (3.761)	-0.536 (1.422)	-21.79** (9.032)
HP × p.80-90	-4.858** (2.106)	-0.351 (0.604)	-1.844 (3.804)	-0.632 (1.417)	-19.59** (9.256)
HP × more p.90	-4.666** (2.104)	-0.597 (0.606)	-3.513 (3.875)	-0.659 (1.418)	-18.52** (9.303)
Personal Loan	-0.268 (1.762)	0.727 (0.579)	0.494 (2.923)	1.027 (0.790)	-7.014 (6.517)
Interaction "Personal Loan" & "Income decile" (Baseline: PL & less than p.10)					
PL × p.10-20	-0.561 (2.019)	-0.708 (0.655)	-4.634 (3.326)	-0.560 (0.895)	15.88** (7.802)
PL × p.20-30	-1.148 (1.863)	-0.623 (0.602)	-0.455 (3.225)	-0.921 (0.832)	10.94 (7.049)
PL × p.30-40	-0.858 (1.845)	-0.843 (0.609)	-1.449 (2.976)	-0.827 (0.820)	4.664 (6.859)
PL × p.40-50	0.0880 (1.819)	-0.900 (0.591)	-1.067 (2.992)	-0.457 (0.805)	7.579 (6.769)
PL × p.50-60	-0.542 (1.801)	-0.959 (0.592)	-2.169 (3.049)	-1.045 (0.793)	7.525 (6.870)
PL × p.60-70	-0.239 (1.816)	-1.140* (0.588)	-1.688 (3.017)	-1.141 (0.799)	5.412 (6.753)
PL × p.70-80	0.265 (1.795)	-0.596 (0.587)	-0.485 (2.995)	-0.975 (0.798)	5.176 (6.683)
PL × p.80-90	0.156 (1.797)	-0.735 (0.584)	-1.896 (3.019)	-1.131 (0.794)	5.917 (6.747)
PL × more p.90	-0.208 (1.792)	-0.840 (0.587)	-2.901 (3.019)	-0.879 (0.797)	12.43* (6.839)
Credit card(s)	2.624 (1.684)	-0.671 (0.614)	7.858*** (2.961)	1.195* (0.666)	10.44 (6.870)
Interaction "Credit Card" & "Income decile" (Baseline: CC & less than p.10)					
CC × p.10-20	-3.137* (1.796)	0.0603 (0.698)	-6.386* (3.259)	-2.247*** (0.731)	-11.95 (7.984)
CC × p.20-30	-3.059* (1.791)	0.122 (0.644)	-5.188 (3.182)	-1.023 (0.751)	-8.078 (7.363)
CC × p.30-40	-2.336 (1.755)	0.436 (0.640)	-7.573** (3.078)	-0.772 (0.700)	-5.405 (7.336)

CC × p.40-50	-3.469**	(1.726)	0.779	(0.629)	-8.114***	(3.040)	-1.310*	(0.707)	-14.76**	(7.070)
CC × p.50-60	-3.048*	(1.724)	0.600	(0.627)	-8.306***	(3.073)	-1.496**	(0.690)	-9.250	(7.264)
CC × p.60-70	-3.033*	(1.709)	0.600	(0.619)	-6.628**	(3.024)	-1.593**	(0.686)	-9.255	(6.983)
CC × p.70-80	-3.015*	(1.722)	0.328	(0.621)	-9.326***	(3.019)	-1.299*	(0.684)	-12.01*	(7.141)
CC × p.80-90	-2.991*	(1.702)	0.477	(0.624)	-8.300***	(2.969)	-1.540**	(0.684)	-11.72	(7.193)
CC × more p.90	-2.929*	(1.716)	0.550	(0.624)	-8.362***	(3.066)	-1.432**	(0.684)	-8.558	(7.181)
Mail Order	-1.045	(1.499)	1.570***	(0.425)	-4.212**	(2.121)	0.264	(0.637)	-2.107	(5.053)
Interaction "Mail Order" & "Income decile" (Baseline: MO & less than p.10)										
MO × p.10-20	0.798	(1.640)	-1.275**	(0.516)	4.459*	(2.442)	-0.919	(0.685)	1.482	(5.929)
MO × p.20-30	-0.604	(1.587)	-1.045**	(0.480)	3.055	(2.411)	-0.423	(0.683)	-1.667	(5.988)
MO × p.30-40	0.906	(1.578)	-1.427***	(0.482)	5.227**	(2.295)	-0.946	(0.690)	-1.032	(6.018)
MO × p.40-50	1.961	(1.629)	-1.545***	(0.467)	3.086	(2.331)	0.137	(0.686)	0.860	(5.658)
MO × p.50-60	1.394	(1.593)	-1.377***	(0.456)	4.373*	(2.379)	-0.380	(0.678)	-0.0791	(5.438)
MO × p.60-70	0.470	(1.570)	-2.108***	(0.452)	4.271*	(2.363)	0.0182	(0.670)	-0.0471	(5.658)
MO × p.70-80	1.177	(1.584)	-1.775***	(0.454)	5.375**	(2.375)	-0.437	(0.684)	-3.498	(5.831)
MO × p.80-90	1.034	(1.599)	-2.099***	(0.480)	3.233	(2.369)	-0.242	(0.678)	3.248	(5.623)
MO × more p.90	-0.371	(1.620)	-1.760***	(0.472)	4.967*	(2.588)	-0.700	(0.689)	-3.488	(6.590)
Loans from ind	-3.510	(4.454)	1.753*	(1.001)	1.789	(7.406)	1.013	(1.131)	2.863	(21.225)
Interaction "Loans Individual" & "Income decile" (Baseline: LI & less than p.10)										
LI × p.10-20	3.373	(5.225)	-0.445	(1.478)	-7.337	(8.511)	-0.762	(1.634)	-25.29	(24.003)
LI × p.20-30	-0.533	(4.671)	-2.477**	(1.180)	1.520	(7.926)	0.755	(1.280)	7.467	(22.809)
LI × p.30-40	2.588	(5.177)	-1.194	(1.191)	-2.403	(7.890)	-1.427	(1.401)	-2.260	(22.110)
LI × p.40-50	3.033	(4.632)	-2.793**	(1.117)	-4.244	(8.618)	-0.431	(1.374)	2.254	(20.223)
LI × p.50-60	4.007	(4.577)	-1.505	(1.063)	-3.792	(7.545)	-0.397	(1.416)	-3.505	(21.857)
LI × p.60-70	4.618	(4.464)	-1.496	(1.029)	0.800	(7.557)	-0.750	(1.195)	4.422	(21.915)
LI × p.70-80	2.677	(4.552)	-1.287	(1.040)	-6.853	(7.887)	-1.599	(1.202)	3.218	(21.659)
LI × p.80-90	1.563	(4.682)	-1.887*	(1.071)	-1.234	(7.669)	-0.446	(1.446)	2.356	(21.735)
LI × more p.90	2.557	(4.664)	-1.585	(1.070)	-5.795	(7.760)	-1.656	(1.190)	-10.13	(22.657)
CC % HH income	0.0164**	(0.008)	0.00241	(0.003)	0.0287	(0.018)	0.00529	(0.004)	0.00312	(0.044)
log HH income	-12.81***	(0.801)	-2.866***	(0.209)	-5.203***	(1.288)	-2.604***	(0.321)	-8.860***	(2.612)
log HH income t-1	0.298	(0.189)	-0.0366	(0.062)	0.819**	(0.351)	0.177**	(0.076)	0.713	(0.813)
Observations	11244		10384		8406		8538		8339	
R <sup>2</sup> (within)	0.638		0.481		0.258		0.268		0.108	

Robust standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the estimations of equation 3.1 using fixed-effects panel regressions of households' expenditures on household's income decile, usage of consumer credit by product and its interaction with the income decile, the household's consumer-debt-to-income-ratio, households' income and its first lag, and a set of control variables. The control variables include whether the household has investments and their value, whether the household saves and the savings ratio, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, and the highest academic qualification. Additionally, the regressions controlled for region fixed effects and month and wave of survey time effects.

The next product in table 3.5 is mail order. This chapter has already found

evidence that households that used mail order agreements tended to be at the bottom of the income distribution, which usually correlates with exclusion from more formal types of consumer credit. These households had a higher expenditure of 1.57 pp more of their income (significant at the 1% level of significance) going to energy. This effect disappeared for households in higher income groups, as the coefficient of the interaction of mail order was negative and significant for all other groups. These agreements also had a negative and significant effect on housing expenses, equal to 4.21 pp, for households in the first income decile. This effect seemed to cancel itself out for households in higher income deciles (second, fourth, and above the median). This can also suggest that households that used these agreements were mainly at the bottom of the income distribution and consumed housing that was overall cheaper (and maybe of lower quality) than the housing that wealthier households consumed. A similar pattern was observed for households in the first income decile that used loans from individuals. They spent 1.75 pp more of their income than did households in other income groups on this item. This suggests that the poorest households used informal loans to meet monthly necessity payments (although the overall use of this product was less than 2% of the sample for all waves).

Another variable worth examining is “CC % HH income.” In this case, the chapter found that the consumer credit debt-to-income ratio had a positive and significant effect of 0.02 pp per 1 pp increase on grocery expenditures (significant at the 5% level). Before, there were also significant effects on housing and leisure, but it seems that these effects diminished. Nonetheless, it is still important to control the level of indebtedness to avoid any financial distress. This is particularly the case because it seemed that the need of meeting regular payments, and not finance of leisure or consumer durables, put pressure on these levels. As before, the rest of the control variables kept in most cases their magnitude, sign, and level of statistical significance, signaling once again a strong robustness of the specification of the equations, even after including all the distributional interactions. Overall, these results provided empirical evidence of the importance of financial education, particularly for poorer households. The fact that different products have different effects on households’ expenditures, and that these effects vary across the income distribution, thus affecting consumption inequality, highlight the importance for households to understand how to use and benefit from consumer credit. The effects can be positive as in hire-purchase agreements for consumer durables consumption but can have serious negative effects, particularly for poorer households, as with credit and store cards used for necessity goods expenditure.

**Table 3.6:** Effect of consumer credit on well-being

	(1)	(2)	(3)	(4)
	Likert	Likert	Caseness	Caseness
Owes money	0.0704 (0.143)		-0.0000303 (0.080)	
Hire purchase		0.0874 (0.188)		0.00229 (0.107)
Personal loan		0.0985 (0.175)		-0.0204 (0.099)
Credit card(s)		-0.0378 (0.157)		0.00320 (0.094)
Mail order		0.223 (0.228)		0.0758 (0.129)
Loans from individual		-0.729 (0.465)		-0.268 (0.278)
CC % HH income	0.0144*** (0.005)	0.0146*** (0.005)	0.00832*** (0.003)	0.00879*** (0.003)
log HH income	-0.0542 (0.223)	-0.0519 (0.223)	0.00782 (0.137)	0.00963 (0.137)
log HH income t-1	0.141 (0.100)	0.140 (0.100)	0.0949* (0.055)	0.0946* (0.055)
Income decile (Baseline: less than p.10)				
p.10-20	-0.248 (0.299)	-0.241 (0.299)	-0.193 (0.177)	-0.191 (0.177)
p.20-30	-0.219 (0.345)	-0.209 (0.345)	-0.285 (0.203)	-0.281 (0.203)
p.30-40	-0.162 (0.396)	-0.159 (0.396)	-0.245 (0.232)	-0.244 (0.232)
p.40-50	0.0255 (0.420)	0.0296 (0.420)	-0.0447 (0.250)	-0.0427 (0.249)
p.50-60	-0.0585 (0.451)	-0.0474 (0.451)	-0.239 (0.269)	-0.233 (0.269)
p.60-70	0.231 (0.484)	0.239 (0.484)	0.0189 (0.288)	0.0224 (0.288)
p.70-80	-0.222 (0.518)	-0.209 (0.519)	-0.305 (0.308)	-0.300 (0.308)
p.80-90	0.458 (0.548)	0.463 (0.549)	0.0337 (0.329)	0.0365 (0.329)
more p.90	0.501 (0.630)	0.505 (0.631)	0.0127 (0.380)	0.0149 (0.380)
Constant	-0.689 (7.676)	-0.860 (7.680)	-2.870 (4.442)	-2.901 (4.453)
Observations	10804	10803	10804	10803
R <sup>2</sup> (within)	0.0812	0.0817	0.0737	0.0738

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

The table presents the estimations of equation 3.2 using fixed-effects panel regressions of measures of subjective well-being (i.e., Likert and Caseness) on access to any kind of consumer credit agreement (columns (1) and (3)), or by each type of consumer credit product (columns (2) and (4)), the household's consumer-debt-to-income-ratio, households' income and its first lag, household's income decile, and a set of control variables. The control variables include whether the household has investments and their value, whether the household saves and the savings ratio, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, the highest academic qualification, health, age, and marital status. Additionally, the regressions controlled for region fixed effects and month and wave of survey time effects.

### 3.4.2 Effect of consumer credit on household well-being

Next, the chapter turns its attention to analyzing the effects of consumer credit on household well-being. This exercise estimated a series of fixed-effects panel regres-

sions that took the form of the following equation:

$$Z_{it} = \mu_i + D'_{it}\Delta + \gamma \frac{CC_{it}}{m_{it}} + \theta_k \text{p.m}_{i,k,t} + W'_{it}P + \phi_j R_j + \lambda_k T_k + v_{it}, \quad (3.2)$$

where  $Z_{it}$  is the measurement of subjective self-reported well-being, namely Likert or Caseness,  $\mu_i$  are the respondent fixed effects,  $D_{it}$  is a dichotomic variable that determines whether household  $i$  owes money in any consumer credit product at time  $t$ , and when one looks at the effects by product, it is a matrix containing the information for each kind of consumer credit debt. Therefore, the main coefficients of interest are those contained in the matrix  $\Delta$ . Again, there is also interest in  $\gamma$ , because  $\frac{CC_{it}}{m_{it}}$  is the consumer credit debt-to-income ratio and captures whether high levels of debt (i.e., over-indebtedness) affect respondents' self-reported well-being. The set of variables  $\text{p.m}_{i,k,t}$  contains the information about the income decile  $k$  to which each respondent  $i$  belongs at time  $t$ . As before, these variables report the differences of households across the income distribution, although now for self-reported well-being.  $W_{it}$  is a matrix of observed time-varying control covariates (not reported in the table), including whether the household had investments and the logarithm of their value, whether the household saved and the savings ratio, the logarithm of current household's income, the logarithm of household's income the year before, the current financial situation, future financial expectations, household size, job status of the respondent, home ownership status, the highest academic qualification, health status, age, the square of the respondent's age to account for non-linearities, and marital status. Finally,  $R_j$  are the region fixed effects,  $T_{n,l}$  are the month and wave of survey time effects, and  $v_{it}$  is the error term.

The results of these estimations are reported in table 3.6. The first column presents the results for Likert, the short-run well-being measure, using the aggregated measure of access to consumer credit. Column (2) looks at the effects on this variable but disaggregating consumer credit into its components. Column (3) presents the results for Caseness, the long-run well-being measure, again using the aggregated measure of access to consumer credit. Finally, column (4) looks at the effects on the same self-reported well-being measure but disaggregates the consumer credit by type. The most important and striking thing to note in the four columns is that unlike previous findings in the literature, there were no significant effects of consumer credit on the likelihood of respondents becoming distressed for any of the two measures, or for any type of consumer credit at the disaggregated level. This provides evidence that access to consumer credit does not worsen subjective well-being. Moreover, it is noteworthy that there were no significant differences across

the income distribution. To confirm this fact, the chapter also interacted consumer credit variables with the income decile groups (not reported here) to see whether there were any differences in the effects across the income distribution but did not find any significant differences, except for mail order purchases for the lowest income decile. This suggests once again that what might be occurring is that these households were not financially included in the same way as richer households were and therefore found themselves more often in distress.

The main result of this exercise was captured by the consumer credit debt-to-income ratios. There was a positive and significant effect of this variable for each one of the four specifications presented in table 3.6. It is important to remember that as the value of the self-reported well-being variables increases, the likelihood of a respondent becoming distressed is higher. Therefore, an increase of 1 pp in the consumer-debt-to-income ratio aggravated the short-term well-being in 0.014 points in the Likert scale (average of 11.22 for the entire sample), and the long-term well-being in 0.008 points in the Caseness scale (average equal to 1.85 for the entire sample). This confirms once again that the negative effect of consumer credit on self-reported well-being comes from the level of consumer credit extended that contributes to creating or exacerbating over-indebtedness, and not from the access itself. Therefore, one of the chief contributions of this chapter to the literature is that access to consumer credit has the potential to reduce income inequality without worsening well-being, if and only if households avoid becoming over-indebted.

The chapter ends by running a set of robustness checks. Being aware of the possible endogeneity problem, the author ran estimations that controlled for the possible presence of self-selection bias. To do so, it implemented a series of matching estimators using the propensity score of the closest one or two neighbors, which was calculated as the probability of a respondent using any type of consumer credit with probit models.<sup>21</sup> After matching the observations it calculated the Average Treatment Effect.<sup>22</sup> Table 3.7 reports the results of these exercises.

Consumer credit had a positive and significant effect on energy (0.22 pp at the 1%), housing (0.94 pp at the 1%), leisure (0.25 at the 5%), and consumer durables (1.98 pp at the 1% level). These results were also economically relevant if compared with the mean values for each one of these expenditures in table 3.2. Even though the results seemed to be at odds with what was presented in table 3.3, it is impor-

---

<sup>21</sup>Moreover, it also estimated these effects by using a different methodology and by applying the kernel distribution instead of the closest neighbor method. The results were robust across all the different specifications. All of these estimations are available upon request.

<sup>22</sup>The Average Treatment on the Treated and other statistics of the estimations are also available upon request.

**Table 3.7:** Propensity score matching estimations

	ATE	Standard error	P-value
Groceries	.191277	.2482856	0.442
Energy	.2221668***	.0855588	0.009
Housing	.9351957***	.2834231	0.001
Leisure	.2520017**	.1034894	0.015
Durables	1.984457***	.6241464	0.001
Likert	-.0997039	.1314164	0.448
Caseness	-.0389673	.0708304	0.582
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$			

The table reports the results from estimating a series of propensity score matching estimations (closest neighbor) of the usage of consumer credit on each item of the household's expenditures and on the subjective well-being measures. Column (ATE) reports the average treatment effect.

tant to remember that here, both the access to consumer credit and the level of indebtedness were captured by the same variable. Therefore, the results might be driven more by the level of indebtedness in this case. Moreover, it is also important to acknowledge that these results were only for the average household and that one cannot determine the different effects that the access to or level of consumer credit indebtedness had across the income distribution. Nonetheless, one still found that households used consumer credit to finance the consumption of necessity goods as well as leisure and consumer durables. As explained earlier, expenditures on leisure and consumer durables suggested an increase in households' utility, whereas expenditures on necessity goods using debt can signal a poor understanding of consumer credit or financial struggles. In the future, it will be important to address households' financial acuity because there was empirical evidence that these effects can contribute to consumption inequality, as they vary across the income distribution.

Finally, consumer credit did not have a negative effect on respondents' self-reported well-being. This result extends and corroborates the evidence stated in table 3.6. As a consequence, the chapter conveyed a robust and thorough argument to support financial inclusion, hand in hand with a financial education that boosts financial acuity. Access to cheap and fair short-term funding has the potential to benefit poorer households via the reduction of consumption inequality. However, it is of utmost importance to avoid high levels of short-term indebtedness, in order to prevent households from falling into financial distress and suffering mental health struggles. Accordingly, it remains an important feature of household finance, distinguishing between access to consumer credit and the likelihood of over-indebtedness.



### 3.5 Summary

This chapter set out to analyze the effects of consumer credit on households' consumption across different expenditures and on self-reported well-being. There was empirical evidence of significant effects of consumer credit on households' expenditures. This was the case for subsistence and necessity goods, but also for leisure and consumer durables. Therefore, there were mixed effects of consumer credit on households' utility because increases in consumption of leisure and consumer durables had positive effects on utility, but increases in expenditures of subsistence and necessity goods using consumer credit did not. Moreover, there were distributional effects of using consumer credit on households' expenditures. This was particularly relevant for households at the lower part of the income distribution that had access to hire-purchase agreements and credit cards.

Access to personal loans did not seem to have an important effect on households' expenditures for the items reviewed in this chapter, somewhat at odds with what was expected. There was evidence that households that used mail order purchases behaved differently and tended to be at the lower part of the income distribution. Therefore, the results for mail order on energy consumption (higher for lower income decile groups), and housing (higher for wealthier households), suggested that poorer households used consumer credit to finance necessity goods rather than leisure or consumer durables. Moreover, credit and store cards had significant effects on households' expenditures in housing and leisure, and these effects varied across the income distribution. One can conclude that households at the bottom part of the income distribution used credit and store cards to extend their leisure consumption, thus increasing their utility, but also used them to finance their housing expenses, not contributing to their utility and possibly even showing some signs of financial struggle.

Furthermore, the consumer credit debt-to-income ratio was significant for household consumption of several goods. Future research should focus on whether this channel creates over-indebtedness and what expenditure drives this effect. This is particularly important if households are becoming over-indebted to fund regular payments; although over-indebtedness does not seem to be a desirable situation for leisure or consumer durables consumption either.

The chapter then analyzed the effects of consumer credit on two measures of self-reported well-being. There were no significant effects of consumer credit on either short- or long-run self-reported well-being. Nonetheless, there were positive and significant effects of the level of indebtedness on these measures. Households with higher debt-to-income ratios were more likely to be distressed than were households

with lower levels of consumer credit as a percentage of a household's income. These results were robust to different model specifications, including matching estimators. Nonetheless, these specifications did not allow the analysis of the effects of consumer credit on households' consumption and self-reported well-being across the income distribution, but rather only for the average household.

Further research should evaluate the extent to which different household expenditures affect self-reported well-being. This chapter assumed that households increase their utility when they spend their income on leisure and consumer durables, but do not perceive a significant increase in their utility when they have to allocate a higher proportion of their income to subsistence and necessity goods. There might be important characteristics of the expenditures analyzed here that need to be addressed in greater depth. To some extent, grocery, energy, and housing expenditures can have a positive effect on household utility because to some extent they are not necessity or subsistence goods. By analyzing the effects of consumer credit on households' consumption and self-reported well-being, this chapter covered a significant portion of household welfare. Overall, consumer credit had the potential to increase household welfare through changes in consumption and by not affecting the likelihood of households becoming distressed. More importantly, these effects varied across the income distribution, thus reducing consumption inequality when poorer households derived benefits from consumer credit.

# Chapter 4

## Household financial resilience and consumer credit: Evidence from the WAS 2010–2016

### 4.1 Introduction

Since the late 1970s, a common trend arisen in most advanced economies. Financial management has been transmitted to households as the welfare state has progressively shrunk during the transformation from social democracy to market liberalism ([Offer, 2017](#)). Families are now in charge of funding their education and retirement, on top of housing and all subsistence expenses they had to take care before. Additionally, in most cases, people are also liable for any eventualities that might affect their financial situations. This new economic order creates a state of increased vulnerability and additional pressure on households to become ever-more skillful in the appropriate planning and use of limited resources.

In the United Kingdom in particular, households now face a challenging time. Since the aftermath of the Global Financial Crisis (GFC) in 2008, British families have encountered a slowdown in income growth, low interest rates, worsened labor conditions such as those presented by the gig economy, and diminishing pensions and savings ([The Treasury Committee – House of Commons, 2018](#)) that are making them more vulnerable to exogenous shocks. To compensate for this, British households have been increasing their demand for credit for decades now, even before the GFC. There has been a substantial growth in the demand for credit for house purchases, higher education, and the subprime credit market ([Atkinson, McKay, Collard, & Kempson, 2007](#)). This has had a great effect on families' debt-to-income ratios ([Bunn & Rostom, 2016](#)), thus increasing families' exposure to any external

unforeseen events.

This chapter aims to analyze British households' financial resilience. To begin with, the present study defines financial resilience to be the ability households have to bounce back from a negative financial shock. On the one hand, the types of shocks that families face more commonly include unemployment, illness, death of a relative, and household structural change such as divorce or the birth of a new baby. On the other hand, the degree to which households bounce back can significantly vary across a series of cases. The first possibility is that affected families end up in a worse state than before the shock and do not recover. Another possibility is that households return to a pre-shock equilibrium and continue evolving across their life-cycle consumption paths. A third possibility is that the external eventuality affects people in such a way that the event's aftermath results in the convergence toward a new equilibrium.

This chapter first sets out to answer the question "Is there a measure that correlates with households' probability of falling into financial distress and, moreover, predicts the likelihood of these households overcoming said distress?" The chapter refers to this measure as the financial resilience proxy. Furthermore, the author explores the effects of changes in the financial resilience proxy on the probability of occurrence of a series of events that relate to households' financial resilience. These events cover families' capacity to keep up with their regular financial commitments plus liquidity issues that people face during a certain period. The analysis then extends to explain the differences that appear across the income and wealth distributions for these scenarios. The reason for this is that income and wealth inequalities might permeate into households' vulnerabilities, therefore affecting the households' responses to negative shocks that can continue on in time, creating further inequalities.

Once the relationship between the financial resilience proxy and households' likelihood of falling into financial distress is established, the chapter moves onto analyze the effects of the proposed measure on three aspects of financial resilience. The first such aspect is households' response to a sudden income shock and how the financial resilience proxy affects the probability that their income will last for up to, or more than, 1 year. The next one examines the effects of this variable on families' probability of agreeing to create a liquidity buffer, or what is colloquially known as "saving for a rainy day." The last one evaluates to what extent consumer credit levels and repayments are a burden to British households and how the financial resilience proxy affects the probability of occurrence of this event. With these three aspects, the author seeks to understand the degree to which households are pre-

pared to overcome a negative financial shock, whether they deploy healthy financial management habits, and whether consumer credit can improve financial resilience by creating liquidity, or whether such credit worsens families' financial stress by generating over-indebtedness.

With these goals in mind, the author proposes the logarithm of the household's financial assets over short-term financial liabilities as the financial resilience proxy. There are relevant reasons the chapter uses this measure. First, it has been demonstrated in the literature that the consumer credit debt-to-income ratio is a strong predictor of households' financial distress (Gathergood & Guttman-Kenney, 2016). Moreover, the indebtedness and household's debt-to-total-assets ratios may not be the best choices,<sup>1</sup> among other reasons, because there are some benefits such as tax breaks that apply to mortgage loans (Ynesta & De Queljoe, 2017). Second, the measure should exclude mortgage debt because one can argue that long-term housing debt has a very specific nature that goes hand in hand with families' property wealth and that has very stable features. Because financial resilience is a dynamic concept, one ought to look at those assets and liabilities that morph and mutate more easily. This is because these instruments relate better to the liquidity profile of families. Third, previous measures of financial distress and financial resilience have tended to be ratios of levels of indebtedness, which have not taken into account the nonlinearity properties of consumer credit debt on households' well-being. There is evidence, analyzed in the following section, showing that consumer credit can benefit households' well-being, up to the point at which over-indebtedness has a negative effect that exacerbates financial distress and mental health problems. Therefore, it is coherent to log-linearize the measure to account for these characteristics. Fourth, as the aim is to measure resilience rather than distress, the chapter implements the inverse of the debt-to-assets ratios. Finally, the financial resilience proxy is calculated using financial assets instead of disposable income, as households can liquidate these assets in the short run to access more resources.

This chapter exploits three waves from the *Wealth and Assets Survey* that contain a vast information set regarding British households. The data include but are not limited to demographic information; educational attainment; employment status; and financial management information, including income, assets, liabilities, financial situation, skills and behaviors, and risk profiles. Processing these data, the author first reports a series of t-tests and figures to describe and highlight relevant facts of the data set, comprising household wealth, well-being, composition, and ac-

---

<sup>1</sup> Authors calculate the indebtedness ratio as households' total outstanding debt divided by their annual net disposable income and household's debt-to-total-assets ratio as total outstanding debt divided by the total assets, including financial and non-financial assets.

cess to financial assets and liabilities. Then, the chapter turns to determining what the best methodology is to estimate the equations that answer the research question. After a series of method comparisons, the chapter favors the implementation of Mundlak-Chamberlain correlated-random-effects panel probits for the binary response questions and ordered probits for the non-binary limited-dependent variable exercises. This chapter finds that the financial resilience proxy is a strong predictor of the probability of households being able or not to keep up with their bills and the probability of ending the income period with a liquidity surplus or deficit, thus profiling important features of the likelihood of families falling into financial distress. Additionally, the chapter concludes that this measure also affects households' capacities to sustain a negative income shock, the probability of creating a liquidity buffer, and the probability of consumer credit repayments becoming a burden. Changes to the logarithmic financial assets and short-term liabilities ratio can considerably develop British households' financial resilience, especially for those at the greatest risk.

This chapter contributes to the literature in several ways. It adds to the research that examines inequalities in obtaining access to financial markets, as it shows how wealthier households are more likely than are less wealthy households to participate in a broad range of financial assets. These include ISA accounts, whereby the government channels its main policy that encourages household savings ([The Treasury Committee – House of Commons, 2018](#)). The government has considered other options to nudge people into developing healthy financial assets, some of which are also controversial at best. Asset-based welfare policies are aimed at incentivizing households to accumulate savings and liquid assets that can later be transformed into fixed assets like housing, thus increasing financial resilience ([Collins, 2016](#); [McKnight, 2019](#); [Wallace, Jones, & Rhodes, 2014](#)). This is part of the trend in developed economies that has been shifting away from collective-welfare policies and transferring risk to individuals. [Agarwal, Driscoll, Gabaix, and Laibson \(2009\)](#) have examined nine regulatory strategies aimed at minimizing individuals' financial mistakes. Although there is still a considerable lack of knowledge around the effectiveness of such policies, it is clear that there are some systematic mistakes that households make with regard to financial management ([Willis, 2011](#)), and this seems to be related to the life cycle.

Furthermore, the chapter contributes to a nascent area of household financial economics, namely the study of financial resilience. The chapter proposes a measure that highly correlates with several features of British households' financial resilience. More importantly, the financial resilience proxy indicates that it has the

potential to serve as a better channel through which policy makers can deliver more efficient public policy. This measure has these properties because it is a strong indicator of the likelihood of households falling into financial distress: the probability that they can withstand external negative shocks; whether they are more prone into developing healthy financial management habits; and whether consumer credit and its repayments can become a burden to households. Moreover, this chapter is a steppingstone that connects the literature on financial literacy and capabilities with financial resilience, in the sense that it examines the different dimensions that encompass the financial resilience framework, which includes skills and behaviors analyzed regularly in financial literacy and acuity research. Furthermore, this chapter contributes to public policy research, as it proposes an indicator that can serve as a target for governmental programs because changes in it have bigger effects on poorer households, thus preventing the creation of more inequality. Finally, this chapter contributes to the debate of the optimal use of consumer credit and provides future research questions.

It is increasingly important to study household financial resilience because families today are more vulnerable and exposed to unexpected external events than in previous decades. The GFC of 2008 and the outbreak of the COVID-19 pandemic at the start of 2020 are examples of catastrophic events that put to test households' abilities to deal with shocks and the capacity to recover from them. Moreover, comprehending financial resilience can be challenging, as it involves understanding a series of skills, attitudes, and behaviors, which are usually dependent on other variables such as resources, knowledge, physical and mental health, and paradigms that surround individuals. These factors are constantly evolving and are becoming ever-more sophisticated, making it harder for people to keep up with the task of optimally managing their finances, especially for those in retirement ([Financial Capability Strategy for the UK, 2018](#); [Skinner, 2007](#)). Additionally, understanding the role of consumer credit within the financial resilience framework will improve the current knowledge of the effects of consumer credit on households' well-being. Several studies analyze the demand and use of consumer credit ([Vandone, 2009](#)), but there is still an ongoing debate about whether such usage is beneficial or detrimental for individuals.

There is evidence that consumer credit, although controversial, can produce benefits for borrowers while also being profitable for lenders ([Karlan & Zinman, 2010](#)). In addition, there is a marked trend toward more short-term credit, even outside formal financial institutions. Credit-constrained households in developed economies are turning to high-cost credit such as payday loans to deal with negative shocks and

emergencies, and this trend increased significantly after the GFC ([Agarwal, Skiba, & Tobacman, 2009](#); [Lee & Kim, 2018](#); [Stegman, 2007](#)) and will probably increase even more due to the COVID-19 outbreak. However, there is still mixed evidence around the effects of this type of consumer credit on households' well-being. On the one hand, payday lending can help credit-constrained households mitigate negative shocks, like natural disasters and other severe unexpected eventualities ([Morse, 2011](#)). On the other hand, in normal times, payday lending can actually worsen the financial situation of vulnerable households ([Melzer, 2011](#)).

Nonetheless, consumer credit is becoming more important for economic policy. Even though "consumer credit is a relatively small part of overall household debt (12 percent), [it] has grown rapidly in recent years" ([The Treasury Committee – House of Commons, 2018](#), p. 11) at an even faster pace than income growth. Furthermore, excessive use of short-term debt has shown to be problematic for households. Ordering individuals by their consumer debt-to-income ratio shows that the top 10% hold roughly a third of the total outstanding debt and that this is in excess of 2.5 months of their income before tax ([Gathergood & Guttman-Kenney, 2016](#)), signaling a considerable level of over-indebtedness. According to the Money Advice Service, more than 8 million (one in six) adults are over-indebted in the United Kingdom ([The Treasury Committee – House of Commons, 2018](#)). It defines over-indebtedness as being likely to find meeting monthly bills a heavy burden and/or missing more than two bill payments within a six-month period. In the sample analyzed in this chapter, it was revealed that 23% of participants perceived their non-mortgage debt to be a burden, and particularly, 6.8% declared it to be a heavy burden. Understanding how consumer credit demand affects resilience across the income and wealth distribution becomes critical because the increase of this demand is not homogenous across wealth and income deciles. Although income inequality has been increasing since the 1980s, growth in aggregated demand has remained stable. This is because even though richer households consume a smaller fraction of their income, the bottom 95% have increased their demand through borrowing ([Cynamon & Fazzari, 2013](#)). This also implies that because wealthier households usually save more than poorer families do ([Dynan, Skinner, & Zeldes, 2004](#)), the latter will be more vulnerable and exposed to unexpected negative shocks and life events.

The rest of the chapter is organized as follows. Section 4.2 reviews the literature, locating the topics of financial resilience within the broader research area of household financial economics. It also highlights the relevance of understanding the dynamics of consumer credit demand and how it interconnects with financial liter-



acy, capabilities, acuity and, finally, resilience. It analyzes the relevance of financial inclusion as a means of accessing fair and affordable liquidity in times of distress and when consumer credit constitutes over-indebtedness that aggravates financial distress and mental well-being. Finally, it reports the extent to which financial education has affected household behavior and whether this might be an effective means to improve financial resilience. Section 4.3 describes the three waves of the WAS that are used to undertake the empirical analysis and the variables chosen to do so. Additionally, it presents a series of t-tests and figures that report the descriptive statistics of access to financial assets and liabilities along with a set of wealth variables, well-being, and household composition, across the income and wealth distributions. In this section, one can observe important sources of possible inequalities that are relevant to the analysis of financial resilience. Next, section 4.4 evaluates the different alternatives available to estimate the equations motivated by the research questions and argues why Mundlak-Chamberlain correlated-random-effects panel probits are the best econometric strategy intuitively. Section 4.5 first compares the results obtained by implementing the different alternatives to estimate probabilistic models and evaluates the differences in the results obtained through each methodology, providing empirical robustness of the chosen method. Then it presents and analyzes the results of binary and nonbinary limited dependent variables probabilistic models of the effects of the financial resilience proxy on British households' financial resilience and discusses the findings. Finally, section 4.6 concludes, highlighting the implications of the main findings and proposes future avenues for research.

## 4.2 Literature review

Theories of consumption smoothing over the life cycle (Ando & Modigliani, 1963; Modigliani & Ando, 1957; Modigliani & Brumberg, 1954) and the permanent income theory (Friedman, 1957) are still the mainstream ways used to understand the way in which households maximize their inter-temporal utility function with respect to their budget constraint (Browning & Crossley, 2001). These theories help explain why it is common for young families to enter into debt agreements early on in their lives to acquire housing, usually through mortgages, and to purchase education, vehicles, furniture, and other consumption goods, primarily via consumer credit (Browning & Lusardi, 1996). Nonetheless, there is sufficient empirical evidence that demonstrates that a considerable portion of households optimize their consumption path according to the relative income theory (Duesenberry, 1949), meaning they are always trying to catch up with their peers in a *keeping up with the Joneses* way.

These groups of theories are still the basic framework in which to carry out research on household finance.

The study of household finance is still in a rather nascent research area within financial economics (Tufano, 2009). Even though there has been considerable growth and ever more interest in the field, economists are still in the process of acknowledging this field as a separate and independent body from standard asset pricing and corporate finance (Campbell, 2006). Guiso and Sodini (2013) have argued that household finance is an emerging field that studies families' financial decisions around planning, savings, investment, expenditure, credit, and others.<sup>2</sup> Theories that aim to explain households' financial decisions have derived from traditional neoclassical economics models, but due to the increasing evidence of the particularities of households behaving systematically in different ways from theoretical predictions, two lines of research have started to gain greater interest. The first one is behavioral household finance (Meier & Sprenger, 2010), which assumes that households do not follow the rationality assumptions of neoclassical models and therefore are prone to making errors in a systematic pattern (Stango & Zinman, 2009; Willis, 2011). The second one is focused on introducing and analyzing frictions that can affect households' decision-making processes (Campbell, 2006). This chapter follows the latter, as it studies the factors that determine and can improve the likelihood of families bouncing back to a preferred equilibrium following an external negative shock, for instance, financial resilience.

Research on financial resilience is an even more recent field of research in household financial economics. The term resilience first appeared in the 1970s to describe the ability of a spring to return to its original form after an external shock. This concept relates both to the stability of a system and to its ability to bounce back from said shock. Davoudi (2012) has reviewed the ontological debate and evolution of this concept from its engineering perspective (returning to a previous equilibrium), discussing its ecological definition (converging to a new equilibrium), up to its evolutionary concept (constant transformation in a chaotic system that leads to multiple equilibria). Since its appearance, the concept of resilience has been adapted to different areas of knowledge such as geographical economics, psychology, and environmental sciences, to name a few.<sup>3</sup> In physics, the concept of resilience is related to the ability to rebound, adapt, and/or recover from a shock back to a preexist-

---

<sup>2</sup>A thorough review of the literature and methodologies that have been used to study consumer credit can be found in Bertola et al. (2006) and Durkin et al. (2014).

<sup>3</sup>For a critique on the uses of the concept of resilience within capitalism and neoliberalism see Walker and Cooper (2011), and for a proposal toward the debate around resourcefulness, see MacKinnon and Derickson (2013).

ing equilibrium, and economics has adopted and adapted this definition to include insecurity and uncertainty (Christopherson, Michie, & Tyler, 2010), converging to a Pareto equilibrium. More recently, the concept has been applied to personal financial management and individual economic circumstances (Wallace et al., 2014), which gives birth to the concept of household financial resilience as it is used in this chapter.

Financial inclusion is a first step toward building financial resilience, but as this chapter shows, much more is needed. Lamb (2016) argued that although financially excluded households tend to make more use of high-cost credit than financially included households, this decision is not related to the skills and capabilities people need to optimize their use of savings accounts and credit facilities, thus showing that financial literacy needs to go hand in hand with financial inclusion. There is still a considerable portion of households in advanced economies that remain excluded from affordable formal financial services (Carbó, Gardner, & Molyneux, 2005), even basic savings and current accounts. Moreover, having an account is a necessary condition for saving, but it does not always result in formal saving. There is evidence that in developed economies, around a quarter of account owners do not save formally (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018). Accordingly, households with limited savings are particularly vulnerable to negative financial shocks such as unemployment, ill health, death of a close one, the birth of a child, divorcing and therefore are more likely to experience financial hardship.<sup>4</sup> Evidence shows that these problems are persistent through time (S. Brown, Ghosh, & Taylor, 2014).

Moving beyond financial inclusion, one ought to examine whether households have access to affordable and prompt liquidity in times of financial adversity (Morse, 2011). Regarding access to affordable credit, extensive research in the microfinance literature exists. Hudon, Labie, and Szafarz (2019) reviewed this literature and argue that microfinance has evolved from aiming at alleviating poverty through the funding of income-generating activities in developing countries of Asia and Latin America to providing financial inclusion of the poorest (Roodman, 2012; Servet et al., 2011), benefiting individuals and society as a whole by overcoming financial exclusion and granting fair access to financial services (Labie, Méon, Mersland, & Szafarz, 2015). However, as in many other areas of financial inclusion and credit granting, there is an important concern as to what extent financial inclusion can increase over-indebtedness, even when there seems to be enforcement of desired practices such as self-regulation (Afonso, Morvant-Roux, Guérin, & Forcella, 2017).

---

<sup>4</sup>For problems with housing repayments see Böheim and Taylor (2000) and May and Tudela (2005).

Access to affordable credit is important ([Karlan & Zinman, 2010](#)), as it allows households to cope with negative shocks ([Morse, 2011](#)). Nonetheless, accumulation of debt can lead to future rejection from credit and to more worrying and then to over-indebtedness. This state of over-indebtedness can make households more vulnerable to further shocks, particularly low-income families, as was so during the GFC ([Ben-Galim & Lanning, 2010](#)). Moreover, poor financial literacy, capability, and management could be the cause of over-indebtedness ([McKnight, 2019](#)). Therefore, the state of over-indebtedness might not be solved by better financial acuity but through better access to stable employment ([Ben-Galim & Lanning, 2010](#)). This can increase peoples' regular income, and through that channel, boost their resilience to future financial shocks.

Financial literacy has been commonly defined as the skills and knowledge associated with effective financial management for lifetime financial security ([Hastings, Madrian, & Skimmyhorn, 2013](#); [Lusardi & Mitchell, 2014](#); [Noctor, Stoney, & Stradling, 1992](#); [Remund, 2010](#)), including awareness of financial products and their definitions, mathematical skills and numeracy, and financial planning. As [McKnight \(2019\)](#) has documented financial literacy is a necessary but not sufficient condition of financial resilience. To achieve financial resilience, one ought to add to the financial literacy skills the attitudes and behaviors ([Gathergood, 2012b](#)) that reflect an appropriate ability to manage both daily financial tasks and significant life events and financial distress, in other words, financial capability ([Atkinson et al., 2007](#)). Furthermore, critical costs are associated with financial literacy that stem from the fact that households must invest in it, through financial education or similar types of training, for instance those related to gaining mathematical skills early in life ([Jappelli & Padula, 2013](#)).

Consumers with lower financial literacy tend to own more high-cost, short-term debt because they do not have the capacity to make informed decisions ([Agarwal, Skiba, & Tobacman, 2009](#); [Lusardi & Mitchell, 2014](#); [Lusardi & Tufano, 2015](#)), as they do not understand the terms in which consumer credit is priced, resulting, too, in higher debt-to-income ratios ([Disney & Gathergood, 2013](#)). Even though the regulatory bodies like the Financial Conduct Authority have contributed toward controlling these markets via the introduction of caps on the maximum interest rate applicable to these loans ([Edmonds, 2018](#)), there remains much to do in terms of aiding the public grasp and use the information related to credit agreements ([Stango & Zinman, 2009, 2011](#)) that can successfully help them to reduce its demand ([Bertrand & Morse, 2011](#)). Financial literacy is a highly relevant skill for modern households because there is well-established evidence that shows that financially

literate consumers depict desirable characteristics, such as contributing to the proper functioning of financial markets at the macroeconomic level and healthy financial habits like saving, paying bills, budgeting, and planning at the microeconomic level (Hilgert, Hogarth, & Beverly, 2003). Nonetheless, even developed economies have high rates of financial illiteracy, and many people do not plan properly for retirement (Skinner, 2007), at least saving for a *rainy day*, especially among those in minority communities and more vulnerable groups (Lusardi, 2010; Lusardi & Mitchell, 2014).

Fernandes, Lynch Jr., and Netemeyer (2014) conducted a meta-analysis of the relationship of financial literacy and financial education with financial behaviors and concluded that these interventions did not have significant effects of relevant magnitudes and, moreover, the effects disappeared in the short term. One can argue that these results suggest that previous interventions have not addressed the most important elements of human behavior (Willis, 2011), like the sense of knowledgeability and confidence (Hadar, Sood, & Fox, 2013), and therefore have not generated the expected results. Furthermore, it could be the case that policy makers have not understood the externalities created by the interventions implemented so far (Gneezy, Meier, & Rey-Biel, 2011), and they could improve these interventions, perhaps through nudging (Goldstein, Johnson, Herrmann, & Heitmann, 2008; Lusardi & Mitchell, 2014). Collins and O’rourke (2010) have argued that some of the main problems in the financial education and counseling literature stem from selection bias, measurement errors, the time dimension of the data, and programs’ design, among others. Overcoming these issues could result in better studies that address this topic more thoroughly. Additionally, the lack of evidence in the long run could also imply that financial education and counseling should be imparted at every stage of life, especially early on (Jappelli & Padula, 2013) and people should be exposed to knowledge and training in these skills, in order to develop the literacy, capabilities, acuity, and, through that channel, the desired financial resilience.<sup>5</sup> This reasoning diverges from the argument that interventions have the potential to diminish, sustain, or enhance resilience (Davoudi, 2012). According to McKnight (2019), three main policies would serve to improve financial resilience. These include incentives to accumulate emergency savings (saving for a rainy day); providing an adequate and well-designed social safety net (beyond the scope of this chapter); and improving financial capability (i.e., ability to manage finances well, including financial literacy and behavior).

Calculating and measuring financial resilience is still a serious challenge. There

---

<sup>5</sup>Personal finance was introduced in the United States in the educational curriculum as far back as the 1960s (Hastings et al., 2013), whereas in the United Kingdom, it was only established toward the end of the last decade.

have been descriptive studies that looked at households' savings and access to liquidity through income, savings, or borrowing (Demirgüç-Kunt et al., 2018). In fact, not many studies in the extant literature have proposed adequate measurements of financial resilience. One important exception is M. Taylor (2011), who measured financial capability in the United Kingdom using the British Household Panel Survey. Despite this, there has been some significant progress toward understanding the ways in which financial resilience can be measured. Overall, there is an important degree of consensus on what a financial resilience framework should comprise. There are mainly four components, including economic resources, financial products and services, financial knowledge and behavior, and social capital (Anderson & Muir, 2018; McKnight, 2019; Muir et al., 2016; Salignac et al., 2019). For example, some measures of financial resilience include the existence and level of a financial buffer, proactive actions toward managing finances more efficiently, and access to social resources and support after negative shocks (Financial Capability Strategy for the UK, 2018). Recently, some studies have turned to the dynamic aspect of financial resilience and have looked into the way in which people respond to external shocks. The GFC was the biggest negative financial shock to households in recent times.<sup>6</sup> Wallace et al. (2014) examined how households reacted and adjusted their financial planning after a severe housing-wealth shock that reduced their welfare and, moreover, their access to liquidity in the equity credit markets. These kinds of shocks have significant effects on consumption, through the marginal propensity to consume, and these effects vary across the wealth distribution, with poorer households being more severely hurt (Mian, Rao, & Sufi, 2013).

A critical issue for this chapter is the role that consumer credit plays in financial resilience. Gathergood and Guttman-Kenney (2016) analyzed the probability of households falling into financial distress and associated it with the consumer debt-to-income ratios (DTI), especially after negative life events. They found that usually younger households with lower incomes are at greater risk of falling into distress and tend to report lower health and mental well-being. The present chapter extends their work, arguing that because DTI does not have linear effects on households' risk of falling into financial distress, there is a need for a log-linearized measure that accounts for these non-linearities. Moreover, this chapter goes beyond the risk of financial distress and additionally studies households' capability to bounce back from negative shocks (i.e., financial resilience). Furthermore, most of the econometric strategy implemented by Gathergood and Guttman-Kenney (2016)

---

<sup>6</sup>At the time this chapter was written, the COVID-19 pandemic outbreak was still too recent to measure its impact on households' finances, although there were signs that these might be even bigger than those of the GFC.

is composed of linear probabilistic ordinary least square models, which have several issues of endogeneity and estimated probabilities, even though the authors do not seem to acknowledge this. These problems are explained and corrected in section [4.4.1](#). The next section presents the three waves from the WAS that are harnessed in this chapter, the descriptive statistics and initial findings obtained from the data set.

## 4.3 Data and descriptive statistics

### 4.3.1 Data

To carry out the present study, this chapter sourced information from a longitudinal panel of three waves from the *Wealth and Assets Survey* (WAS), covering the period 2010–2016. The WAS is a survey that takes place in Great Britain, thus includes England, Wales, and Scotland south of the Caledonian Canal, and does not include Northern Ireland nor the Isles of Scilly. The survey was begun in 2006 and is carried out in cycles of two years per wave. The most recent release contained the information from wave 5, corresponding to the period 2014–2016. On average, since wave 3, there have been around 20,000 households interviewed per wave. In deciding which waves to use, the author aimed at optimizing the number of respondents to increase the sample size of the panel, subject to the most important information from harmonized questions being consistent and present in all waves when possible.

The main purpose of exploiting the information of a survey is that its disaggregated design enables the researcher to disentangle the distribution of several variables across the population. Studies with aggregated data are useful for analyzing macroeconomic trends, particularly across a significant period of time. Nonetheless, these kinds of data lack the features necessary to study relevant and topical subjects for households belonging to a specific group or with a certain range of characteristics. Among several dimensions, the WAS extends the information availability to create a more encompassing and complete measure of wealth that includes ownership of assets (financial, physical, and property), pensions, savings, and debt ([Office for National Statistics, 2017](#)). Moreover, the fact that the survey is designed to be representative of the population means that it additionally helps to inform macroeconomic policy and to compare the results with those found using aggregated data. Therefore, the WAS is a strong candidate to provide the sufficient amount of information with the required quality level needed for studies of household finance ([Campbell, 2006](#)).

Particularly, this study aims at proposing a metric that correlates with a broad



range of factors that cover British households' financial resilience. To do this, one needs information about households' economic resources and balance sheets, including whenever possible all assets and liabilities. Likewise, researchers need access to more respondents' characteristics related to financial resilience such as the ones mentioned in the previous section, containing financial products and services; financial knowledge and behavior; and social capital. A clear advantage of the WAS is that it reports information on financial products and services via financial assets and liabilities along with financial knowledge and behavior in some sections of the questionnaire. These include saving attitudes and behavior, attitudes about saving for retirement, financial situation and expectations, financial acuity, and attitudes about risk (Blais & Weber, 2006; Weber, Blais, & Betz, 2002). A limitation of the WAS however is that it does not include enough questions related to access to social capital, and therefore, it is an aspect of financial resilience not covered in this chapter.

The WAS is divided into two components. The first one is the household-level module. This module asks questions about the household composition and demographic information about its members; the relationship among household inhabitants; type of tenure; and questions related to physical and property wealth, such as value and mortgages on the property, value of vehicles and household goods, and budgeting and financial planning. The second module is the individual-level questionnaire. Apart from the subsections already mentioned, this module asks respondents about their ethnicity, sexual identity and religion; social well-being; economic status; occupation and labor information; education and work history; and other demographic information that is later used in the estimations. With this set of information, this chapter constructs the financial resilience proxy and evaluates its relationship with a series of events and shocks that encompass households' likelihood of falling into financial distress and, furthermore, their ability to bounce back from it. This is all done while controlling for an extensive range of socioeconomic and demographic household characteristics. The next subsection describes in greater detail the variables used in the following econometric exercises.

### 4.3.2 Descriptive statistics

Figure 4.1 presents the access to or ownership of financial assets across the wealth and income distributions for the three waves in the data set and a range of 11 products along with a lack of any financial assets (final plot). This figure describes how inequality can affect households' financial resilience, as households with higher incomes or that are wealthier had greater financial assets that they could liquidate

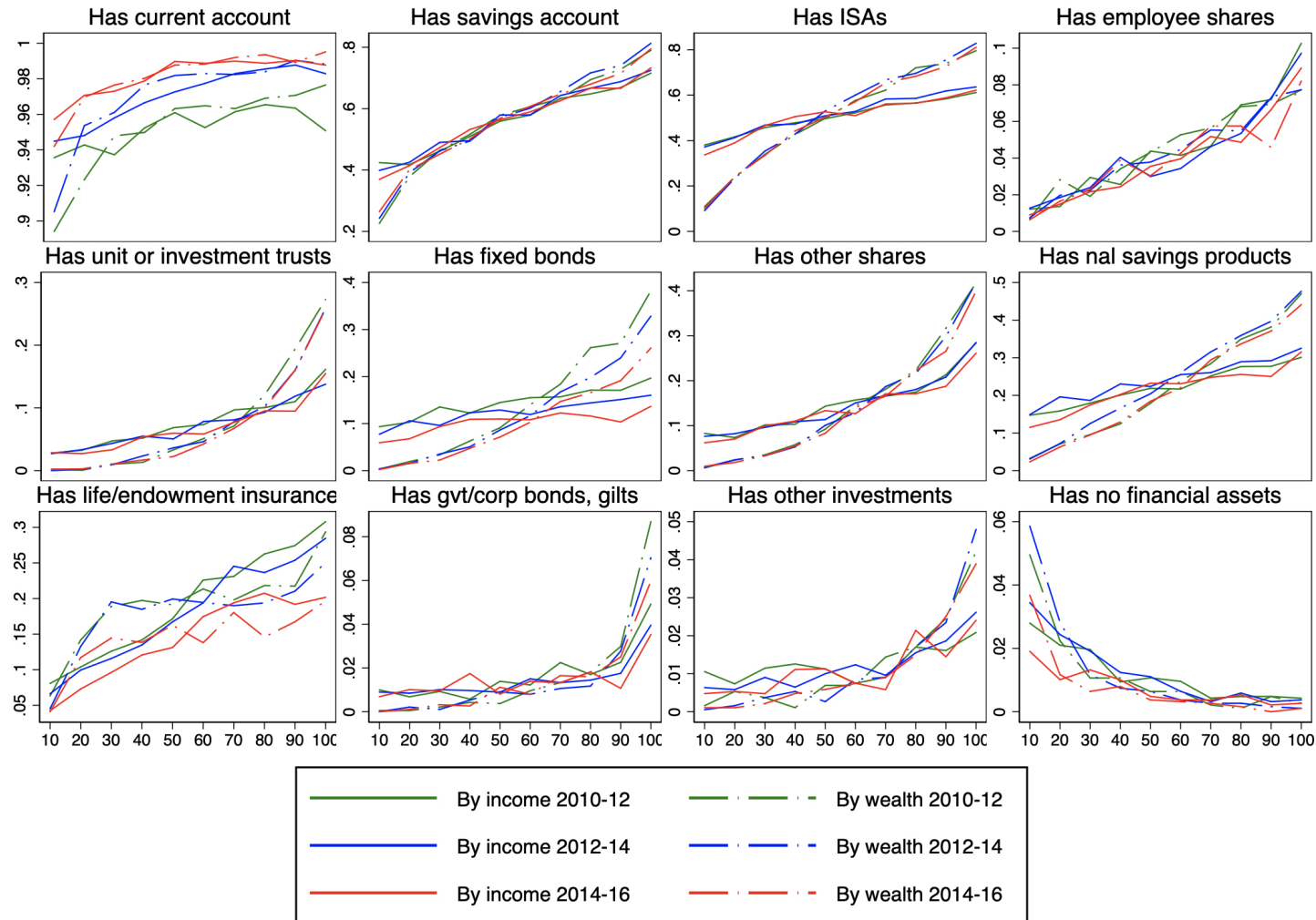


in the event of a negative shock. As one observes in the figure, there was a positive trend for all series (except for the last plot), implying that as households moved up the income and wealth deciles, a higher proportion of them participated in these markets, and a lower proportion of them lacked any financial assets at all (last plot).

Looking more closely into the graphs helps better explain the nuances of these differences across various financial instruments. The plot to the top left of the graph contains the ownership of a current account. It shows that most of the sample's were participants financially included (i.e., bancarized), ranging from close to 90% for the bottom decile in 2010 to almost a 100% for the top decile in 2016. There was also a higher participation for the most recent wave, signaling higher participation across all income and wealth deciles as time passed.

Nonetheless, the picture changes quite dramatically when looking at different savings products. The top-middle-left and top-middle-right plots tell a similar story. There was a clear upward trend across the income and wealth distributions for savings accounts and ISAs. Particularly for the latter, there was a marked difference when the data were plotted across the income or the wealth distributions. The data showed that across the income distribution, the ownership of this asset ranged from around 40% of the sample at the lowest decile to up to 60% at the top decile. There was still a non-negligible difference of around 20 percentage points from tail to tail along the distribution, but this difference became dramatic along the wealth distribution. In this case, the ownership of ISAs went from around 10% at the first decile to up to 80% at the last decile. It is important to take this statement into account in terms of economic policy, as currently, the “principal savings incentive provided by the Government takes the form of tax relief on interest, primarily through ISAs” ([The Treasury Committee – House of Commons, 2018](#)). This fact could be increasing wealth inequality, instead of addressing it, as wealthier households tend to save more ([Dynan et al., 2004](#)), particularly in a time when inflation is eroding the earnings from cash ISAs and the tax benefits are only worthwhile for the wealthiest ([Pickford, 2020](#)).

**Figure 4.1:** Access to/ownership of financial assets by wealth and income distribution 2010-16



Note: this figure presents the access to or ownership of several financial assets or lack of any of them (last plot), across the income (continuous line) and wealth (dotted line) distributions, for the three waves of the WAS. The overall message of the figure is that ownership of financial assets varies greatly across the distributions, and moreover, there are important differences when this is plotted across income or wealth.

This same pattern arose for other assets that represent different investment opportunities for households, both fixed and variable return instruments. In the figure, there were important differences within plots between the income and wealth distributions for investment trusts, fixed bonds, and other shares. For other products such as employee shares, life or endowment insurance, government or corporate bonds, or in general other investments, the difference between using the income or wealth distributions was not that marked. Nevertheless, the main message presented by figure 4.1 is systematically repeated across plots; there were strong differences across the income and wealth distributions that motivate a detailed analysis of how financial assets and liabilities affect households' financial resilience and whether inequalities are reinforced through this mechanism. This exacerbates the existing inequalities when one notices that there is a positive correlation between wealth and financial literacy and between financial literacy and investment returns (Deuffhard, Georgarakos, & Inderst, 2019).

Figure 4.2 reports the ownership of store cards by income and wealth distributions for the three waves (columns 1–3) in the data set. As before, there was less variation in the ownership of store cards when plotted across the income distribution (first row), compared with when the data were plotted across the wealth distribution (second row). An initial message the graph presents overall is that the popularity of store cards decreased over time and remained rather low across all the deciles; less than 2% at any decile owned a store card, for all waves and for both distributions.

However, dissimilarities appeared again between the income and wealth distributions that might suggest some inequalities could be hidden if these differences are not taken into account. Ownership of store cards seemed to be increasing more markedly across the wealth distribution, even though use of this card as consumer credit (carrying balance over next period) was more common for the lower deciles. This phenomenon could suggest that access to store cards is easier for wealthier households, as expected, even when these households do not rely on these cards as often as poorer households do. There might be many reasons this is the case, but some to consider are differences in the preferences in the demand and use of these cards (Vandone, 2009), exposure to negative shocks, and financial exclusion, among others.

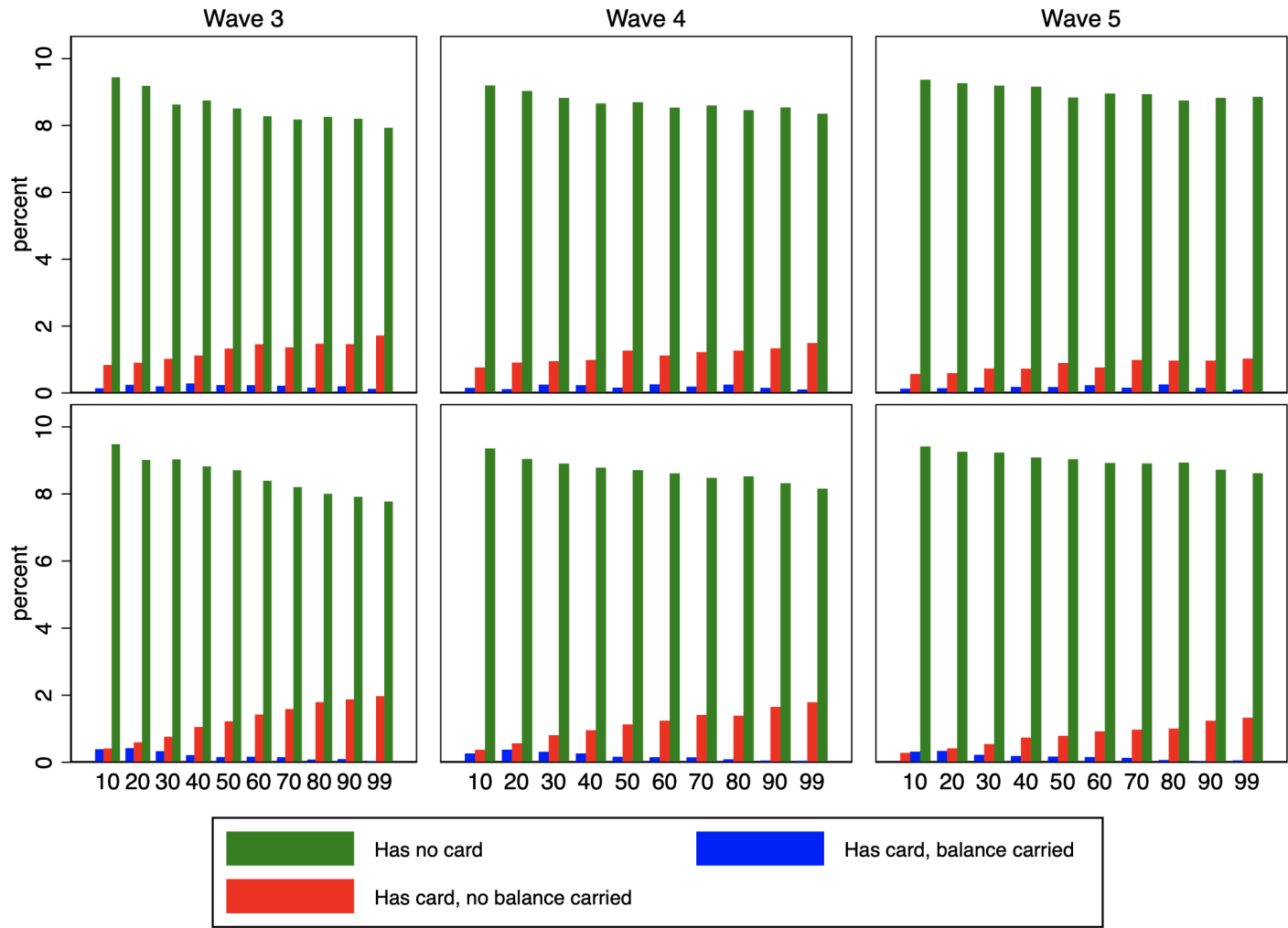
Furthermore, figure 4.3 illustrates these points more thoroughly and with more clarity for the ownership of credit cards. In this case, for both distributions there was a clear pattern that emerged with respect to the access or ownership of this instrument. Wealthier households and households with higher incomes owned credit cards more frequently, and this trend remained stable for all the waves in the sam-

ple. This highlights the importance for households of having access to affordable and manageable short-term credit, particularly in the case of a negative financial shock ([Morse, 2011](#)), as the difference in ownership of an instrument as popular and common as a credit card is not likely to be determined by many factors beyond the income or wealth of the respondents ([Vandone, 2009](#)). Nonetheless, there is evidence that a correlation exists among wealth and financial literacy ([Jappelli & Padula, 2013](#)), numeracy, and credit card usage and debt repayments ([Soll, Keeney, & Larrick, 2013](#)).

Additionally, a relevant disparity that appeared between the plots across the income and wealth distributions was the use of credit cards as consumer credit (balance carried over next period). When the data were plotted across the income distribution, it seemed that the use of credit cards was rather homogeneous across the distribution, even with some concentration around the upper-middle deciles (70th–90th percentiles). Nonetheless, the picture changed across the wealth distribution. In this case, the use of credit cards as short-term credit depicted a clear hump concentrated around the first 4 deciles. After that, there was a downward linear trend up to the last decile. This again suggests that there were important differences across the wealth distribution that were hidden when plotting the data throughout the income distribution. These differences are relevant when one realizes that around two-thirds of borrowers in advanced economies access credit through credit cards, and only one-third do so through financial institutions ([Demirgüç-Kunt et al., 2018](#)). Moreover, if there are existing biases in the preferences of poorer households, there will be additional pressure for these households to accumulate debt.

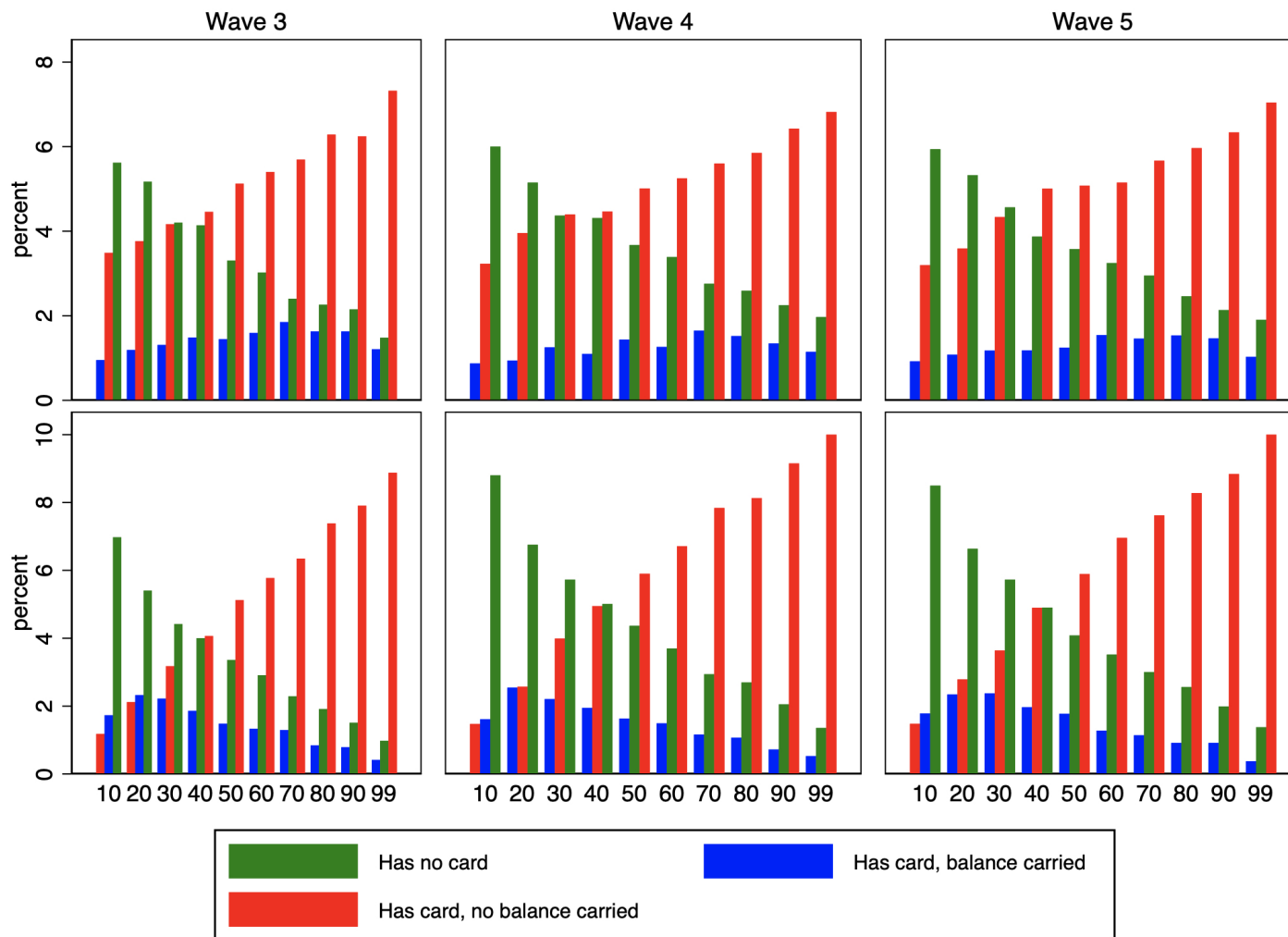
Moreover, it is rather relevant to understand the effect of these differences on households' financial resilience. To do so, it would be important to recognize and disentangle how different respondents make use of their credit cards and whether these short-term liabilities are being used to increase the household's wealth via the acquisition of consumer durables, or if instead, respondents use them to finance subsistence goods or household bills or if they are a funding source people resort to after a negative financial shock due to illness, unemployment, or any other unanticipated life event (see chapter [3](#)).

Figure 4.2: Ownership of store cards by income and wealth distributions 2010-16



Note: this figure presents the access to or ownership of store cards across the income (upper row) and wealth (lower row) distributions, for the three waves of the WAS. The overall message of the figure is that although store cards are becoming less popular, access to them is concentrated around wealthier households, whereas their use is concentrated around the least wealthy households.

**Figure 4.3:** Ownership of credit cards by income and wealth distributions 2010-16



Note: this figure presents the access to or ownership of credit cards across the income (upper row) and wealth (lower row) distributions, for the three waves of the WAS. The overall message of the figure is that access to credit cards is clearly concentrated around wealthier households. Moreover, the usage pattern of credit cards varies when plotted across the income and wealth distributions.

Table 4.1 presents the main descriptive statistics of the entire sample and the t-tests of means difference for each variable between each pair of waves.<sup>7</sup> The first four rows contain the information regarding households' total wealth, disaggregated into its 4 components and measured in sterling pounds. These are physical, property, pension, and net financial wealth. The first component, physical wealth, includes the value of all consumer durables in the household plus the value of the vehicles of the household. The second, property wealth, is the net property value, which is calculated as the sum of the value of the residence, other houses, buildings, land, overseas land, and other properties minus the sum of the value of all mortgages and equity releases. The third component is pension wealth, calculated as the sum of the value of the personal pension, occupational defined benefit and contribution pensions, retained rights in a defined benefit, contribution and personal pensions, additional voluntary contributions, pensions in payment, and pension from former spouse or partner. Finally, the fourth component is net financial wealth. To calculate net financial wealth, the WAS subtracts the short-term financial liabilities from the gross financial wealth. This chapter focuses both on assets and liabilities but gives special attention to consumer credit (short-term liabilities) and its effects on financial resilience. Households' short-term liabilities include the value of credit card balance; store cards; mail order; hire purchase; amount of all loans (excluding student loans but including all formal loans and loans from family and friends); current account overdrafts; and mail order, hire purchase, loan, and bill arrears. This last category is particularly interesting, as it does not tend to be included in the literature as regular liabilities, but they still have an enormous impact on households' financial capabilities (Duygan-Bump & Grant, 2009). This category does not include mortgages, as property net wealth accounted for them. Gross financial wealth is the added value of all formal and informal financial assets, child trusts funds, other children's assets, and endowments. The formal financial assets include the value of current accounts in credit, savings accounts, ISAs, national savings products, UK shares, insurance products, fixed-term investment bonds, employee shares, unit and investment trusts, overseas shares, UK and overseas bonds (Gilts), and other investment and formal financial assets.

The initial clear observation from all the wealth measurements is that the median (P50) value was appreciably below the arithmetic mean.<sup>8</sup> This indicates that

---

<sup>7</sup>For a more detailed review of the descriptive statistics see appendix C.1. The relevance of this exercise is that it extends the analysis per wave and across the income distribution. This allows one to disentangle the presence of variations in the evolution of the series across time and across families with different incomes. Overall, these detailed descriptive statistics suggest considerable increases in inequalities, as poorer households do not perceive wealth growth, unlike richer families.

<sup>8</sup>This is actually underestimated, as the maximum value for these variables was capped at the

wealth was highly concentrated toward the right end of the distribution, as has been reported widely in the literature. This is even more worrisome when taking into account that since the 1950s, every generation “has lower median net wealth than the preceding five-year cohort had at the same age” ([The Treasury Committee – House of Commons, 2018](#)). Moreover, examining the minimum value of each one of the wealth measures suggests that there were households that were significantly vulnerable and poor, as they had a low value of physical wealth, no property nor pension wealth, and even negative net financial wealth (short-term liabilities in excess of their financial assets). If these households are dependent solely on their income stream, they will very likely be vulnerable to external negative shocks and likely will not be able to return to the pre-shock equilibrium for a considerable period.

**Table 4.1:** Summary Statistics and t-tests - financial resilience

Variable	Obs	Mean	Std Dev	Min	Max	P50	W2-W1	W3-W2	W3-W1
Physical (£000s)	56320	58	47	2.5	304	48	2.7***	4.5***	7.2***
Property (£000s)	56320	223	258	0	1500	160	9.3***	28.4***	37.7***
Pension (£000s)	56319	138	237	0	1273	33	21.5***	20.8***	42.3***
Net Fin. (£000s)	56320	90	184	-33	1159	21	9***	7.7***	16.7***
Health	48308	2.08	.93	1	5	2	0.03***	0.05***	0.08***
Anxiety	39706	2.43	2.92	0	10	1	-0.20***	-0.07**	-0.27***
HH size	56319	2.53	1.23	1	9	2	-0.02*	-0.03***	-0.06***
Fin. resilience	56320	6.17	5.48	-10.7	13.9	7.8	0.34***	0.18***	0.52***
Behind bills	32153	.03	.18	0	1	0	0.00	-0.01**	-0.01***
Bill keeping	31609	.67	.47	0	1	1	NA	0.08***	NA
Out of money	48128	.21	.41	0	1	0	-0.03***	-0.03***	-0.07***
Money left	47950	.54	.5	0	1	1	0.09***	0.04***	0.14***

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the main descriptive statics of the entire sample and the t-tests of mean differences for each variable between each pair of waves. The statistics reported are the number of observations, mean, standard deviation, minimum, maximum, and median (P50). The variables described in the table are the four measures of wealth (physical, property, pension, and net financial), the variables of physical and mental well-being, household size, the financial resilience proxy, and the four events related to bill keeping and liquidity struggles.

There is growing literature focused on the effects of financial distress on households’ well-being, and at the same time, how well-being can affect households’ decision-making process and affect the likelihood of financial distress (e.g., [Bridges and Disney \(2010\)](#); [Fitch, Hamilton, Bassett, and Davey \(2011\)](#); [Gathergood \(2012a\)](#); [Jenkins et al. \(2008\)](#); [M. Taylor, Jenkins, and Sacker \(2011\)](#)). Therefore, looking at

---

99th percentile in the sample.



how these variables behave will shed some additional light on the necessity of conducting an analysis that looks beyond the average household and comprehends the disparities of financial resilience in different dimensions. The first of these variables is general health. This variable was measured from 1 to 5, with 1 being very good and 5 being very bad health. In this case, the mean and median are rather close, suggesting a normal distribution for the variable. The fact that the value of this variable significantly increases over time can be an indication of the aging pattern of the panel, more than actual decreases in health of the average British citizen. The next variable is the self-reported level of anxiety. This variable was measured from zero to 10, with higher reported values meaning higher levels of anxiety. In this case, the mean was considerably higher than the median, suggesting that some respondents were struggling with mental health issues that might have affected their financial choices. Also, there was a significant decrease in the value of this variable, indicating an improvement in the respondents' mental health.

The next variable is the proposed measure of financial resilience, whose variance is able to explain the capabilities of British households to bounce back from a negative financial shock (e.g., unemployment and illness). This variable was calculated as the logarithmic transformation of the households' financial assets and short-term liabilities ratio. This improves the statistical properties of the variable, and additionally, it highlights in greater detail the particular characteristics of the distribution, like the presence of two local maxima around which observations clustered, making it a bimodal distribution, as shown in figure 4.5's upper-left plot. For this variable, the mean value is below the median, depicting the presence of poorly financially resilient households in the data set (clustered around and to the left of the mean of the first local maximum in the figure). Moreover, its value significantly increases across waves, suggesting that on average, people became more resilient during the period of analysis. However, around 17% of the respondents in the data set reported a value of their short-term liabilities higher than the value of their financial assets. This suggests that there was an important fraction of British households at risk of struggling to pull out of any financial adversity. This issue is somewhat hidden when one looks at the average and even median households.

Finally, the last four rows contain the descriptive statistics and t-tests for the four dependent binary response variables that present the scenarios used to answer the research question. As these are dichotomic variables, the mean value represents the percentage of respondents for which the variable took the value of one. In other words, in the sample, 3% of households were behind with their bills, whereas 67%

were keeping up with them.<sup>9</sup> Along the same lines, 21% of respondents were left with no money at the end of their income period, whereas 54% managed to arrive at the end of this period with a liquidity surplus. Overall, the average values for all these variables improve across wave, showing an improvement in the financial situation of British households. The last three columns of the table report the t-tests, where positive values indicate increases in the mean values of each variable and negative values indicate the opposite. The fact that almost all the t-tests were significant highlights the relevance of controlling for time-fixed effects to account for the trend in the variables that might not be related to households' idiosyncratic characteristics.

The next section describes the econometric strategy implemented to estimate the effects of the logarithm of the financial ratio on the probability of falling behind with household bills or keeping up with them and the probability of arriving at the end of the week or month without money or with a positive cash balance. Furthermore, the next section looks at the marginal effects of the logarithm of the financial ratio on the duration of financial resources after an income drop, the attitudes toward saving for a rainy day, and whether short-term debt is a burden. All of these are dimensions of households' financial resilience, and the chapter implements correlated-random-effects panel probits and ordered probits, allowing for one to study them across the income and wealth distributions.

## 4.4 Econometric strategy

This section presents the econometric strategy implemented to analyze a wide range of aspects of British households' financial resilience. Following [Salignac et al. \(2019\)](#), the chapter examines three of the four dimensions that research ought to take into account for conceptualizing and measuring financial resilience, namely economic resources, financial products and services, and financial knowledge and behavior.<sup>10</sup> The first dimension covers the money-related factors such as income, savings, and debt management. The second dimension, financial products and services, was described in detail in the previous section and included access to financial assets and liabilities. The last dimension included in the following regressions covers households' financial knowledge, risk aversion profile (e.g. opinion to buy on credit),

---

<sup>9</sup>These are different questions and therefore they do not have to add up to a 100. Additionally, this shows how and why the wording of the questions matter, as respondents can understand these two questions to mean something different than exclusive alternatives.

<sup>10</sup>The fourth dimension that was not directly measured in the WAS is social capital (i.e., access to credit, knowledge, and support, from family, friends, and the local community in times of hardship).

and proactive actions taken toward financial resilience (e.g. income saved in the last 2 years). These factors are combined as the independent variables that explain the variation in the probability of occurrence of an array of events that evidence households' financial resilience.

To begin the analysis, this chapter defined the variable of interest, that is, the financial resilience proxy, as the logarithmic ratio of households' financial assets to short-term financial liabilities (i.e., excluding mortgages). The main arguments the chapter presents are that this measure captures households' abilities to keep up with their short-term commitments, acts as a financial buffer, has the potential to signal financial household distress at an early stage and, more importantly, correlates with the likelihood of households recovering from a negative life event or external financial shock.

After defining the variable of interest that proxies British household financial resilience, the aim is to establish the relationship between the short-term logarithmic financial ratio and the following features of households' financial resilience. Specifically, the chapter first analyzes the probability of households a) falling behind on bills, b) keeping up with bills, c) arriving at the end of the week or month without money, or d) having money left at the end of the period. Afterwards, the research extends the analysis to examine the effect of the financial resilience proxy on a set of ordinal dependent variables that include how long, ranging from a week to more than a year, the respondents would be able to make ends meet if they lost their main source of income (financial negative shock), the degree to which respondents make sure that they have money saved for a rainy day, and the extent to which debt is a burden.

The first set of equations this chapter set out to estimate take the following form:

$$P(Y_{it} = 1 | \log(\text{Fin Ratio})_{it}, \text{p.m}_{i,k,t}, X_{it}, W_t, c_i) \quad (4.1)$$

where  $P(\cdot)$  is a function of the response variable  $Y_{it}$ , conditioned on a set of time variant and invariant covariates and an unobserved time-invariant effect.  $Y_{it}$  are binary response variables that capture the aforementioned events a), b), c), and d).  $\log(\text{Fin Ratio})_{it}$  is the proposed measure of financial resilience, calculated as the logarithmic ratio of the household's financial assets and liabilities (excluding mortgages). The set of variables  $\text{p.m}_{i,k,t}$  contain the information about the income and wealth deciles  $k$  to which each household  $i$  belongs at time  $t$ . These variables depict the differences in households' response probability to any of the events across the income and wealth distributions. Next,  $X_{it}$  is a matrix of observed time-varying covariates, including how well the respondent knows his or her account balances, opin-

ion about buying on credit, preference between receiving £1,000 today or £1,000 next year, whether it is better to play safe with savings, affinity to take risks to gain returns, whether the respondent saved any income in the last 2 years, and gender (non-time-varying).<sup>11</sup> Finally,  $W_t$  is the wave of survey time effects, and  $c_i$  accounts for the households' time-invariant unobserved effects.

#### 4.4.1 Methodological criteria

The primary challenge at this point is to estimate a model that captures the effect of the variable of interest on the different limited dependent variables included in the regressions, while minimizing the likelihood of the estimators being inefficient or, even worse, inconsistent (i.e., coefficients that are biased and whose bias do not disappear as the sample size increases). As the chapter deals with limited depended variables, effectively it estimates probabilistic models. There is a series of methodologies from which to choose to estimate probabilistic models. These methodologies can be divided broadly into two: linear probabilistic models (LPM) and index models (IM).

There are advantages and disadvantages associated with both sets of methodologies, and therefore, the best approach is to compare and evaluate the significance of the discrepancies among the different methods. The advantages of LPM are the ease with which they are estimated and, perhaps more importantly, the fact that there are tools that control directly for the fixed effects at the agent level in the panel regressions.<sup>12</sup> The main disadvantage of LPM is that LPM can predict probabilities outside the unit interval. According to Wooldridge (2010, p. 563), “The fact that some predicted probabilities are outside the unit interval need not be a serious concern. But there is no guarantee that the LPM provides good estimates of the partial effects for a wide range of covariate values, especially for extreme values of  $x$ .” Because this is precisely the case in the following regressions, as the analysis focuses largely on studying various particularities across the income and wealth distributions, a strong argument for implementing IM exists.

Index models guarantee that the estimated probabilities lie within the unit interval, therefore having an advantage over LPM. The two best known and commonly used IM are panel probit and panel logistic regressions. The former assumes that

---

<sup>11</sup>Apart from these and included in the regressions as socio-demographic control variables, but not reported in the tables are general health, level of anxiety, education level, economic activity, marital status, household size, and age group. Moreover, all estimations were calculated with clustered robust standard errors to account for the presence of heteroskedasticity in the regressions.

<sup>12</sup>The authors ran Hausman tests for all the specifications presented in this chapter. In all cases, the conclusion of the Hausman test was to reject the null hypothesis that the differences in the coefficients from the random effects and fixed effects models were not systematic.

the error term in the equation has a standard normal distribution whereas the latter assumes that the error term has a standard logistic distribution. Usually the results obtained through both methods tend to be rather similar. Nonetheless, IM do not control directly, at least in an ideal way, for fixed effects at the agent level in probabilistic panel regressions. One way to work around this issue is to implement Mundlak-Chamberlain -type correlated random effects into the probabilistic models (Mundlak, 1978; Chamberlain, 1980). Another possibility is to combine Allison (2009) hybrid models with the IM. A third option would be to run fixed effects logistic panel regressions as in Wooldridge (2010, p. 619).

In the spirit of Wooldridge (2010, p. 623) and following Schunck (2013), this chapter analyzed the discrepancies across six distinct options of methodologies to estimate the binary response models for events a), b), c), and d), using as independent variables the  $\log(\text{Fin Ratio})_{it}$  and its standardized versions as required, and the wave-time fixed effects. The result of this exercise is reported in tables 4.2, C.4, C.5, and C.6. For each table, column (1) presents the results from the LPM using panel fixed effects regressions. Column (2) reports the results of the random-effects panel hybrid LPM, in which the independent variable is not entered in its levels, but as a standardized form, separating it into the centered variable and its mean across time for each agent (Jann, 2017). Column (3) shows the output of the LPM Mundlak-Chamberlain correlated-random-effects panel regression, in which the variable of interest is entered both in its levels and additionally as the mean for each panel across all waves. Column (4) depicts the marginal effects, which are the partial derivatives of  $P(\cdot)$  with respect to  $\log(\text{Fin Ratio})_{it}$  (centered and mean), from the random-effects hybrid probit IM. Column (5) presents the marginal effects from the Mundlak-Chamberlain correlated-random-effects panel probit IM. Finally, column (6) reports the marginal effects from the fixed-effects panel logistic IM, in which only observations for agents that reported both values in the response variable are used. The following section presents the results of these exercises and extends the analysis via the chosen methodology.

**Table 4.2:** Probability of falling behind with bills - method comparison

	(1)	(2)	(3)	(4)	(5)	(6)
	XT Fixed Effects	XT Hybrid RE	XT Corr. RE	XT Prob. Hybrid RE	XT Prob. Corr. RE	XT Logit FE
Fin. Assets/Liab.	-0.00741*** (0.000)		-0.00703*** (0.000)		-0.00581*** (0.000)	-0.0577*** (0.002)
Fin. Assets/Liab. (centered)		-0.00703*** (0.000)		-0.00581*** (0.000)		
Mean of Fin. Assets/Liab.		-0.00992*** (0.000)	-0.00289*** (0.001)	-0.00944*** (0.000)	-0.00363*** (0.000)	
Constant	0.0809*** (0.003)	0.0956*** (0.004)	0.0956*** (0.004)			
Predicted probability	0.0327	0.0317	0.0317	0.0320	0.0320	0.5094
Observations	32153	32153	32153	32153	32153	1618
Within R <sup>2</sup>	0.0253	0.0253	0.0253			
Between R <sup>2</sup>	0.106	0.108	0.108			
Overall R <sup>2</sup>	0.0869	0.0886	0.0886			

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Clustered standard errors in parentheses. Column (1) presents the results from the LPM using panel fixed effects regressions. Column (2) reports the results of the random-effects panel hybrid LPM, in which the independent variable is not entered in its levels, but as a standardized form, separating it into the centered variable and its mean across time for each agent (Jann, 2017). Column (3) shows the output of the LPM Mundlak-Chamberlain correlated-random-effects panel regression, in which the variable of interest is entered both in its levels and additionally as the mean for each panel across all waves. Column (4) depicts the marginal effects, which are the partial derivatives of  $P(\cdot)$  with respect to  $\log(\text{Fin Ratio})_{it}$  (centered and mean), from the random-effects hybrid probit IM. Column (5) presents the marginal effects from the Mundlak-Chamberlain correlated-random-effects panel probit IM. Finally, column (6) reports the marginal effects from the fixed-effects panel logistic IM, in which only observations for agents that reported both values in the response variable are used. All regressions included wave time effects that were not reported.

## 4.5 Results

### 4.5.1 Method comparison

Table 4.2 contains the method comparison for the probability of falling behind on households' bills. As seen in column (1), the effect of an increase of 1 in the logarithmic short-term financial ratio, in the panel fixed-effects LPM, had an effect of a decrease of 0.74 percentage points (pp) in the probability of falling behind with bills, with a predicted probability of 3.27% on average. This result is both statistically (at the 1% level) and economically significant, as it suggests that adjustments in households' financial ratios can improve their risk of falling into financial distress due to debt. The random-effects panel hybrid LPM reported in column (2) showed a very similar effect, of 0.7 pp (centered coefficient) and a predicted probability of 3.17%. Column (3) had the same results as column (2), showing no discrepancies in the hybrid and correlated-random-effects panel LPM. The first of the IM reported in column (4) is the random-effects hybrid probit, and it showed a coefficient of -0.0058, somewhat smaller than the previous column, but with a predicted probability of 0.032, which is actually closer to the fixed-effects panel LPM. Column (5) replicated the results of the hybrid model, but implementing the correlated-random-effects panel probit IM. Finally, the results from the fixed-effects panel logistic model presented in column (6) were considerably different from the baseline model, as the sample size shrunk almost 95%, as this methodology only includes agents that reported both values of the dependent variable, increasing the predicted probability of occurrence to 50.94%. One can understand this method and its results as a zoom into that subsample of the population that was really struggling and found themselves at considerable risk of falling behind with their bills. Therefore, adjusting their financial ratio would have an effect 10 times higher (-5.77 pp) than the effect for the average population.

This chapter has evidenced that the results obtained in the regressions are robust to the method specification.<sup>13</sup> Although this is not particularly the case for the fixed-effect panel logistic regression, there are clear reasons that is the case. Panel fixed-effects logistic IM drop a considerable number of observations, as they only keep agents that have both values of the dependent variable across time. Therefore, one can understand this method as a zoom into the subsample that is more likely to be exposed to the occurrence of the event. That is also the reason that in three of the four cases, the predicted probability in these models was considerably higher than it was when using any other estimation methodology.

---

<sup>13</sup>The rest of the exercise comparing the available methods can be found in appendix C.2.

Furthermore, this chapter chose to run the remaining regressions using Mundlak-Chamberlain correlated-random-effects panel probit IM due to the advantages of IM guaranteeing that the predicted probabilities will lie within the unit interval and that fewer issues will arise when estimating coefficients far from the mean. This was preferred to random-effects hybrid probit IM, as the variable of interest is entered into the regression in levels, rather than centered, and this has benefits and implications, particularly when estimating interaction terms (Schunck, 2013). Moreover, as the coefficients reported in the IM models were always smaller than in the LPM, one avoids the risks of overestimating the effects. The next section presents and discusses the results from these estimations.

#### 4.5.2 Households' financial resilience in binary response variables events

This section analyzes the results from the estimation of equation 4.1 using Mundlak-Chamberlain correlated-random-effects panel probits.<sup>14</sup> Specifically, this chapter estimated the following equation for each event:

$$P(Y_{it} = 1 | \log(\text{Fin Ratio})_{it}, \text{p.m}_{i,k,t}, X_{it}, W_t, c_i) = \Phi(\beta \log(\text{Fin Ratio})_{it} + \theta_k \text{p.m}_{i,k,t} + \gamma_k \log(\text{Fin Ratio})_{it} * \text{p.m}_{i,k,t} \dots \dots + X'_{it} \Lambda + \mu_t W_t + \epsilon_{it} + c_i) \quad (4.2)$$

where  $\Phi(\cdot)$  is the normal cumulative distribution function, and as before,  $\log(\text{Fin Ratio})_{it}$  is the logarithmic ratio of households' financial assets and short-term liabilities. Matrix  $\text{p.m}_{i,k,t}$  contains the  $k$  income and wealth deciles to which each household  $i$  belongs at time  $t$ . Next,  $X_{it}$  is a matrix of observed time-varying covariates, including: how well the respondent knows his or her account balances, opinion about buying on credit, preference between receiving £1,000 today or £1,100 next year, whether it is better to play it safe with savings, affinity to take risks to gain returns, whether the respondent saved any income in the last 2 years, and gender,<sup>15</sup> along with additional socio-demographic controls and the means of all variables required in the Mundlak-Chamberlain estimations. Finally,  $W_t$  are the wave of survey time effects,  $\epsilon_{it}$  is the error term, and  $c_i$  accounts for the agent-level unobserved

<sup>14</sup>The author estimated all the equations using 12 points in the quadrature approximation in the random-effects estimators. The results were compared to using 8 and 16 points respectively, and the relative difference in the coefficients was always less than  $10^{-4}$  (0.01%), thus confirming the stability and robustness of the estimations.

<sup>15</sup>A feature of random-effects models is that they allow the inclusion of time-invariant variables, even though the estimations in this chapter controlled for the agent-level fixed effects, as the previous section explained.



effects.

Table 4.3 reports the marginal effects  $\delta\Phi(\cdot)/\delta x_j$ , that is, the partial derivative of the IM function  $\Phi(\cdot)$  with respect to all the independent variables  $x_j$ , for the four events under analysis. These are the probability of falling behind with household bills, keeping up with bills, and arriving at the end of the month without money or with a positive cash balance. The first variable in the table, *Fin. Assets/Liab.*, was analyzed in detail in section 4.5.1 and captures the main measurement of financial resilience that this chapter proposed.

The results of the effects of the financial resilience proxy on the four events reported in the columns of the table were statistically (p-value < 0.01) and economically significant.<sup>16</sup> An increase of 1 in the logarithmic short-term financial ratio resulted in a decrease of 0.48 pp in the probability of falling behind on bills (column(1)) and of 0.80 pp in the probability of arriving at the end of the period without money (column (3)), along with an increase of 0.76 pp in the probability of keeping up with bills (column(2)) and of 0.89 pp in the probability of ending the period with a positive cash balance (column (4)). These results suggest that when in risk of financial distress or over-indebtedness, adjustments to the financial ratio can actually improve the financial resilience of households, in other words, their response to a negative financial shock.

The next set of variables report the effects of households belonging to different income and wealth deciles, compared with the poorest households in the sample, on the probability of occurrence of the events. As seen in section 4.3.2, there were important differences in the inequality created across income and wealth, and therefore, the econometric strategy included both of them. Households' income decile did not have a strong effect on the probability of falling behind with bills, except for the fifth (p-value < 0.01) and tenth (p-value < 0.05) deciles. For these groups, there was a decrease in the probability of 1.44 pp and 1.98 pp, respectively. For the sixth to the ninth deciles, there was also a lower probability but not very significant (p-value < 0.1). This can suggest that there were other factors, such as the wealth decile or financial literacy, which had a bigger effect on households' risk of falling behind on bills.

When examining the other three events, one saw the expected results. Linear trends in the coefficients for income deciles appeared that were statistically significant at the 1% level. The higher the income decile, the higher the probability was of keeping up with bills (ranging from 2.95 pp to 14.33 pp in column (2)) and ending

---

<sup>16</sup>It is worth noting that after introducing all the control variables with their means into the equations, the coefficients dropped slightly, although without changing their direction, significance, or relevance.

the period with a positive cash balance (going from 4.35 pp up to 13.5 pp in column (4)). Similarly, the higher the income decile, the lower the probability of ending the period without money (column (3)), with the effect ranging from -2.65 pp to -6.89 pp. Interestingly, the wealth decile did not result in being statistically relevant for almost any event,<sup>17</sup> apart from the probability of falling behind with bills, for up to the fifth decile (p-value < 0.05), compared with the poorest households. This reinforces the idea that after a balanced financial ratio, access to liquidity, captured by a higher income, can mitigate households' financial distress more than wealth can.

Following the income and wealth distributions, table 4.3 presents the variables that capture households' financial knowledge, households' risk aversion profile, and proactive actions taken toward financial resilience (Salignac et al., 2019). With regard to financial knowledge, households were asked how well they knew their account balance. According to the results, having a rough idea or knowing exactly the account balance had a positive and increasing effect on the probability of falling behind on bills, 0.82 and 1.19 pp, respectively, with a p-value < 0.05.<sup>18</sup> This variable, *ceteris paribus*, most likely reflects the fact that financially distressed households are more aware of their liquidity constraints than are households that are not facing any financial struggles. The fact that this variable did not result significant in any other equation supports this argument.<sup>19</sup>

Following financial knowledge, the next category relates to the risk aversion profile of households. For this aspect, the equation included the perception of buying on credit, the preferences for a reward to exercising patience, how conservative households are with savings, and the willingness to accept risk for a good return. Risk preferences do not seem to be relevant to the probability of falling behind on bills, as none of the variables analyzed here were significant in the first column. In addition, different aspects of the risk preference profile better captured households' behavior, as each one of these variables was significant in different ways for each event.

---

<sup>17</sup>Nonetheless, some of the interactions between the income and wealth deciles with the logarithmic short-term financial ratio estimated in the probits were significant and are analyzed in more detail below (figure 4.4).

<sup>18</sup>Later on, the chapter also looks at the effect of taking financial advice proactively or because of bad debt on the degree of burden of short-term debt.

<sup>19</sup>There was a negative effect of 1.63 pp of having a rough idea of the account balance, opposed to not knowing, on the probability of ending the period with no money, but it was only significant at the 10% level.

**Table 4.3:** Living expenses, liquidity, and financial resilience (marginal effects)

	(1)	(2)	(3)	(4)
	Behind with bills	Keeping with bills	Without money	Money left
Fin. Assets/Liab.	-0.00478*** (0.000)	0.00763*** (0.001)	-0.00795*** (0.001)	0.00885*** (0.001)
HH inc. decile (baseline p.10)				
20	-0.000789 (0.003)	0.0295*** (0.010)	-0.0265*** (0.008)	0.0435*** (0.010)
30	-0.00235 (0.004)	0.0527*** (0.010)	-0.0333*** (0.009)	0.0634*** (0.011)
40	-0.00229 (0.004)	0.0622*** (0.012)	-0.0364*** (0.009)	0.0842*** (0.012)
50	-0.0144*** (0.005)	0.0762*** (0.013)	-0.0372*** (0.010)	0.0836*** (0.012)
60	-0.0104* (0.005)	0.0742*** (0.014)	-0.0506*** (0.011)	0.0956*** (0.014)
70	-0.0104* (0.006)	0.103*** (0.015)	-0.0466*** (0.012)	0.105*** (0.015)
80	-0.0130* (0.007)	0.137*** (0.017)	-0.0587*** (0.013)	0.116*** (0.016)
90	-0.0140* (0.008)	0.138*** (0.018)	-0.0444*** (0.015)	0.128*** (0.017)
99	-0.0198** (0.008)	0.143*** (0.020)	-0.0689*** (0.016)	0.135*** (0.019)
HH wealth decile (baseline p.10)				
20	-0.00724** (0.003)	-0.00144 (0.011)	-0.00150 (0.007)	0.00479 (0.013)
30	-0.0109** (0.004)	0.00109 (0.012)	0.00326 (0.009)	0.0112 (0.014)
40	-0.0122** (0.006)	-0.00521 (0.014)	0.00459 (0.010)	0.00392 (0.015)
50	-0.0138** (0.007)	-0.00463 (0.016)	0.0127 (0.012)	0.00360 (0.016)
60	-0.0141* (0.008)	0.0209 (0.018)	0.00368 (0.013)	-0.00561 (0.018)
70	-0.00989 (0.010)	0.0197 (0.021)	0.0132 (0.016)	-0.00324 (0.020)
80	-0.0164 (0.011)	0.0176 (0.023)	-0.0105 (0.017)	-0.000792 (0.023)
90	-0.0205 (0.013)	0.0170 (0.026)	-0.00731 (0.020)	0.00711 (0.025)
99	0.00147 (0.021)	0.0214 (0.030)	-0.00454 (0.023)	-0.00963 (0.028)
Know account balance (baseline don't know)				
I have a rough idea	0.00821** (0.004)	-0.0116 (0.010)	-0.0163* (0.009)	0.0118 (0.010)
I know exactly	0.0119** (0.005)	-0.00531 (0.012)	-0.0123 (0.010)	0.0110 (0.012)
Buy on credit (baseline agree)				
Neither agree nor disagree	-0.000650 (0.003)	-0.00235 (0.010)	-0.00807 (0.008)	0.00573 (0.010)
Tend to disagree	0.000993 (0.003)	-0.00166 (0.009)	-0.0337*** (0.007)	0.0137 (0.010)
Strongly disagree	0.00275 (0.004)	0.00912 (0.011)	-0.0534*** (0.009)	0.0243** (0.011)
Patience (baseline £1,000 today)				
£1,100 next year	-0.000999 (0.003)	0.0155** (0.007)	-0.0175*** (0.006)	-0.00335 (0.007)
Play safe with savings (baseline strongly agree)				
Agree	-0.000193 (0.002)	-0.0111** (0.005)	-0.000201 (0.004)	0.000404 (0.005)
Neither agree nor disagree	0.000173 (0.003)	-0.0211** (0.008)	0.00350 (0.006)	0.000366 (0.008)
Disagree	0.00232 (0.004)	0.00839 (0.010)	0.00851 (0.008)	-0.0110 (0.010)
Risk for good return (baseline strongly agree)				
Agree	-0.00399 (0.004)	-0.0211** (0.008)	-0.00804 (0.007)	-0.00616 (0.008)
Neither agree nor disagree	-0.00344 (0.005)	-0.0338*** (0.010)	-0.0122 (0.008)	-0.000727 (0.010)
Disagree	-0.00509 (0.005)	-0.0213** (0.011)	-0.00550 (0.009)	-0.0250** (0.010)
Income saved in last 2 years (baseline no)				
Yes	0.00167 (0.003)	0.0829*** (0.007)	-0.0652*** (0.006)	0.137*** (0.007)

Gender (baseline male)							
Female	-0.00401*	(0.002)	-0.00768	(0.005)	0.0144***	(0.004)	-0.0332*** (0.005)
Predicted probability	0.0297		0.6738		0.1978	.	0.5686
Observations	25720		30797		38564		38454

Clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the marginal effects from the estimations of equation 4.2 using Mundlak-Chamberlain correlated-random-effects panel probits to regress the occurrence of the events of each column, on the financial resilience proxy, the income and wealth deciles, how well the respondent knows his or her account balances, opinion about buying on credit, preference between receiving £1,000 today or £1,100 next year, whether it is better to play it safe with savings, affinity to take risks to gain returns, whether the respondent saved any income in the last 2 years, and gender. Additionally, the regressions included socio-demographic control variables such as general health, level of anxiety, education level, economic activity, marital status, household size, and age group. The control variables, as well as the mean of all the variables and the wave time-fixed effects included in the regressions, are not reported in the table.

More specifically, the opinion about buying on credit had significant effects on the liquidity-related events. The more households disagreed with the opinion about buying on credit, the less likely they were to end the period without money, ranging from 3.37 pp to 5.34 pp (p-value  $< 0.01$ , reported in column (3)), and the more likely they were to end the period with a positive cash balance. For those households that strongly disagreed with the opinion about buying on credit, the effect was 2.43 pp (p-value  $< 0.05$ , reported in column (4)). It is important to remember that access to and demand for short-term credit can increase households' well-being and financial resilience (Karlan & Zinman, 2010) up to the point where excess of a household's demand can result in over-indebtedness and financial struggle (Morse, 2011).

The second variable in this category was the preference for a reward for exercising patience, which is captured as the favored option between receiving £1,000 today or £1,100 next year. This patience measure had a significant effect on the probability of keeping up with bills and ending the period without money (p-values  $< 0.05$  and  $0.01$ , in columns (2) and (3), respectively). The former showed an effect of 1.55 pp, and the latter had one of -1.75 pp, demonstrating that households that were more patient provided better signals of budgeting and healthy spending patterns.

The third variable was whether respondents agreed with playing it safe with savings. It was significant only for the probability of keeping up with bills (p-value  $< 0.05$  displayed in column (2)). Households that agreed or were indifferent to the options, as opposed to strongly agreeing, had a lower probability of 1.11 pp and 2.11 pp, respectively, of keeping up with bills. These results signal that the respondents

most conscientious about their savings had a higher likelihood of keeping up with bills, possibly related to a heightened portfolio optimization.

Last in this category: households' appetite for risk. This variable was significant regarding the probability of keeping up with bills (column (2)) and ending the period with a positive cash balance (column (4)). The results from this variable suggest that households that were more conservative in their risk profile were less likely to keep up with bills (between 2.11 pp and 3.38 pp,  $p\text{-value} < 0.05$ ). Likewise, households that were too conservative were less likely to arrive at the end of the month with a liquidity surplus (-2.5 pp significant at the 5% level). Combined with playing it safe with savings, these variables suggest that households' optimal risk profile involved demanding an optimum degree of risk (Blais & Weber, 2006; Weber et al., 2002), while using savings wisely.

Furthermore, table 4.3 reports the effects of proactive actions taken toward financial resilience, captured by whether the respondents had saved any income in the last 2 years. Although the coefficient was not significant in the first event, it was highly significant ( $p\text{-value} < 0.01$ ) and had the expected signs in the other three events. Having saved in the previous 2 years increased the probability of households to keep up with bills by 8.29 pp (column (2)) and of ending the period with a positive cash balance by 13.7 pp (column (4)). Likewise, this behavior reduced the likelihood of ending the period without money by 6.52 pp (column (3)). Compared with the other dimensions of financial resilience, one can argue that proactive actions taken toward creating a financial buffer were very important in contributing toward improving British households' financial resilience.

The final variable reported in this table examined the effect of gender on the events under analysis. There were statistically significant results for the liquidity-related events, with a  $p\text{-value} < 0.01$ .<sup>20</sup> The table reports an increase of 1.44 pp on the probability of ending the period without money and a decrease of 3.32 pp on the probability of ending the period with a positive cash balance. Research has argued that women tend to be less financially literate than men and that this puts them at greater risk of experiencing financial struggles (Lusardi & Mitchell, 2008; Mottola, 2013) and can even affect their financial resilience more than occurs with men. There are strong motivations for promoting equality between men and women, as this might lead to further economic development (Duflo, 2012).<sup>21</sup>

In the spirit of digging deeper into the differences and possible financial-resilience

---

<sup>20</sup>There was an effect of -0.40 pp on the probability of falling behind with bills, ( $p\text{-value} < 0.1$ ).

<sup>21</sup>Nonetheless, the author ran several exercises interacting the logarithmic short-term financial ratio with the gender variable for all the equations estimated in the chapter and did not find any statistically significant differences between gender groups.

inequalities across the income and wealth distributions, this chapter calculated the marginal effects of the financial resilience proxy, evaluated at each one of the income and wealth deciles, for the four events. The results of this exercise are reported in figure 4.4.<sup>22</sup> In this figure, each panel shows the marginal effect of the logarithmic short-term financial ratio, and its 95% confidence interval, for each decile and event. Significant differences appear across deciles when their confidence intervals do not intersect. More precisely, one could argue that there were important differences when there was a clear trend in the estimated coefficients across the distribution. Recall that the analysis here is not whether there was a significant effect of the financial resilience proxy on the events, which was analyzed already, but whether this statistically and economically significant effect varies across income and wealth.

This was especially the case for the probability of falling behind with bills for both the income and wealth distribution; for the probability of ending the period with a positive cash balance, across the wealth distribution; and to some degree, for the probability of keeping up with bills, throughout the income distribution. For the rest of the events, it seemed that the effect was rather constant for all deciles. In the two upper-left panels, one could argue that the effect of the financial resilience proxy was higher in magnitude (i.e., more negative) for the poorest households, as for higher-income and wealthier households the coefficient converged at 0, meaning that the effect was lower. This suggests that this variable is of particular importance for poorer households, which are the ones already at higher risk of falling behind on bills. Similarly, the lower-left panel indicates that the effect of the financial resilience proxy on the probability of keeping up with bills was of particular relevance for households in the first three deciles, although the effect was significant for all. This means that smaller adjustments in the short-term financial ratio will have stronger effects for poorer households, alleviating to some degree the effort they have to put forth to improve their financial resilience. Finally, and again along the same lines, the lower-right panel showed that poorer households exhibited a stronger effect of movements of the logarithmic short-term financial ratio, this time on the probability of arriving at the end of the month with a positive cash balance, across the wealth distribution.

This section looked at the effects of the logarithmic short-term financial ratio on the probability of the occurrence of four events. These events included falling behind on bills, keeping up with bills, ending the period without money, and arriving at the end of the period with a positive cash balance. In each one of the equations, the

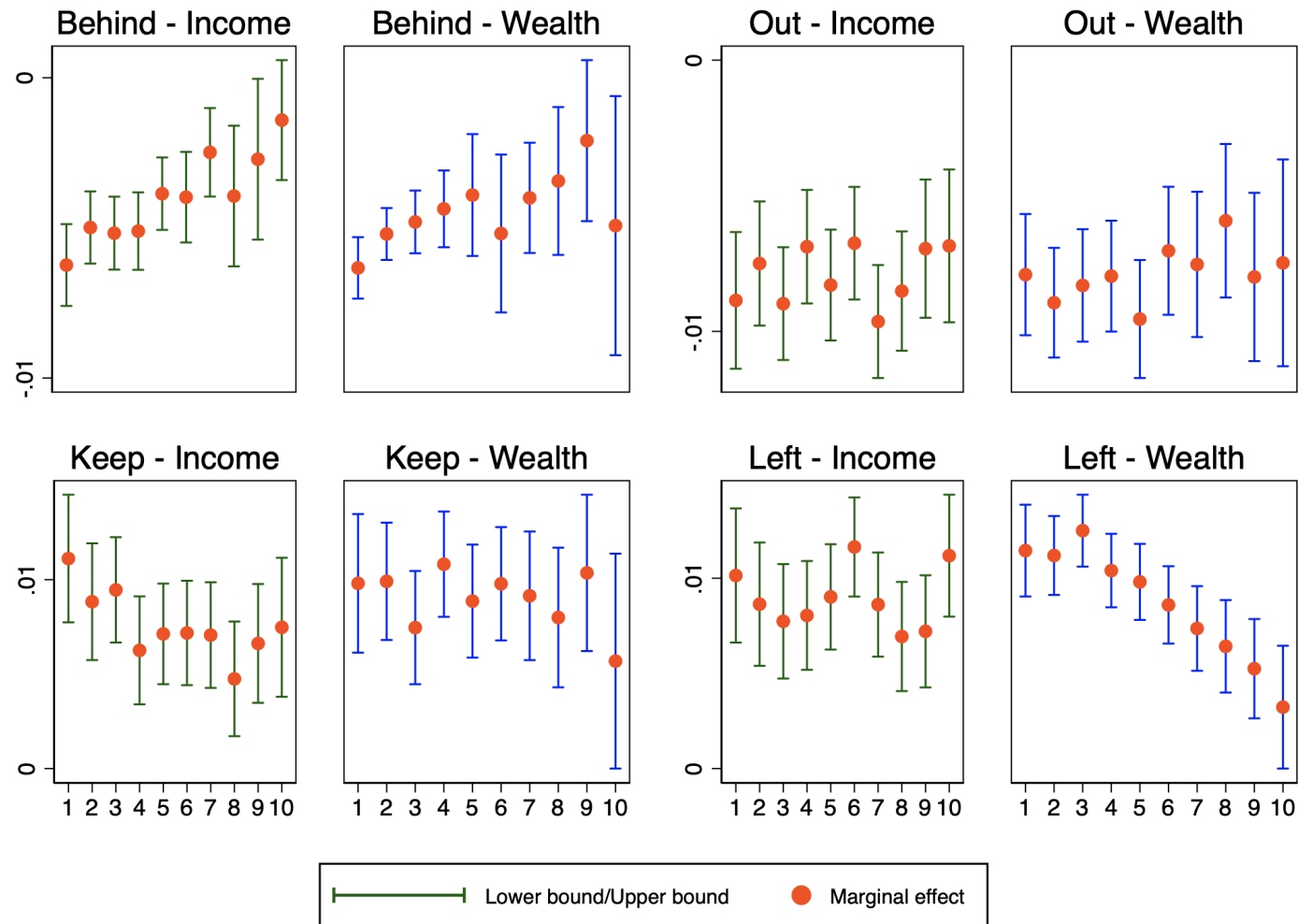
---

<sup>22</sup>These estimations were motivated due to the fact that even though the Mundlak-Chamberlain correlated-random-effects IM contained the interactions, the marginal effects reported were all calculated at the mean of all variables.

results were highly statistically and economically significant. Overall, adjustments to the short-term financial ratio can improve households' financial resilience, if at risk of financial distress. Moreover, the author looked at the effects of income and wealth, arguing that the former was more relevant when predicting the probability of occurrence of any of the events, thus highlighting the importance of access to liquidity when in distress.

Additionally, the estimations analyzed several factors of households' risk profiles and their effects on the probability of the four events. In sum, households that were more patient, and demanded risk for profit while being conservative with their savings, had lower probabilities of ending in distress and higher probabilities of keeping up with their bills and maintaining positive cash balances. Likewise, proactive actions taken toward financial resilience, for example, saving during the last 2 years, had a positive effect on improving respondents' outcomes, except for the probability of falling behind on bills. Finally, there were gender inequalities in the probabilities of the liquidity-related events that suggested that women could benefit from financial education that improves their financial literacy to increase their resilience. The next section extends the analysis and looks at how the financial resilience proxy captured the predictability of the probability of several scenarios in three additional events or situations. The first is an income drop, the second is saving for a rainy day, and the third looks at short-term debt as a burden, all using Mundlak-Chamberlain correlated-random-effects ordered probits.

**Figure 4.4:** Financial resilience across the income and wealth distributions



Note: this figure depicts the differences in the effect of changes in the financial resilience proxy on the probability of occurrence of an event (first name of each plot) across the income and wealth distributions (second name of each plot). There are significant differences when the confidence intervals of the coefficients across the distributions do not intersect.



### 4.5.3 Negative financial shocks, savings, and consumer credit as burden

This section examines three additional aspects of households' financial resilience. First it analyzes the effect of the financial resilience proxy on the response probability of choosing one of six options for the question, *How long would you (and your partner) be able to make ends meet if you lost the main source of income coming into your household?* Then it moves into analyzing the effect of the same variable on the probability of respondents choosing one out of four options of the degree to which they agree about the importance of saving for a rainy day. Finally, it evaluates the level of burden (no burden, somewhat, or heavy) that non-mortgage debt is on households, what nuances one can observe across the Kernel distributions of each case, and the effect of the short-term logarithmic financial ratio on the probability of participants finding themselves in each of these cases. In line with the exercises of the previous sections, this section estimates Mundlak-Chamberlain correlated-random-effects ordered probits to analyze these events.<sup>23</sup>

Table 4.4 presents the marginal effects of the independent variables on the occurrence of each one of the possibilities after an income drop. The six possible options are “less than a week,” “less than a month,” “less than 3 months,” “less than 6 months,” “less than a year,” and “more than a year,”<sup>24</sup> The first row of the table reports the marginal effect of the logarithmic financial assets to non-mortgage liabilities ratio on the response probability for each option. The first four columns reported a negative and significant (p-value < 0.01) coefficient ranging from -0.36 pp for “less than a week” to -0.08 pp for “less than 6 months.” These results suggest that as households improved this ratio, they were less likely to find themselves in each one of these scenarios. Moreover, as respondents increased this ratio by 1, they were 0.98 pp more likely to be able to make ends meet for more than a year (result significant at the 1% level), as column (6) depicted. Although the coefficient in column (5) was not significant, the overall message across the first row is consistent. Adjustments to this ratio can lower the probability of households falling into distress in a shorter period after a negative income shock.

---

<sup>23</sup>As usual, the estimations included additional socio-demographic controls and the means of all variables required in the Mundlak-Chamberlain estimations.

<sup>24</sup>Each one of the groups in this ordered probit represented more than 5% of the respondents, ranging from 7.13% for the smallest group, up to 45.31% for the biggest group, fitting with the model requirements. The predicted probabilities for each group were 6.86, 10.52, 14.78, 11.11, 10.99, and 45.75%, respectively.

**Table 4.4:** Income drop and financial resilience (marginal effects)

	(1)		(2)		(3)		(4)		(5)		(6)	
	Less than a week		Less than a month		Less than 3 months		Less than 6 months		Less than a year		More than a year	
Fin. Assets/Liab.	-0.00355***	(0.000)	-0.00295***	(0.000)	-0.00236***	(0.000)	-0.000815***	(0.000)	-0.0000684	(0.000)	0.00975***	(0.001)
HH inc. decile (baseline p.10)												
20	-0.00457	(0.004)	-0.00362*	(0.002)	-0.00287	(0.002)	-0.00112	(0.002)	-0.000353	(0.002)	0.0125*	(0.008)
30	-0.0104***	(0.004)	-0.00475**	(0.002)	-0.000476	(0.003)	0.00171	(0.002)	0.00253	(0.002)	0.0114	(0.008)
40	-0.0193***	(0.004)	-0.0106***	(0.003)	-0.00316	(0.003)	0.00188	(0.002)	0.00388**	(0.002)	0.0273***	(0.009)
50	-0.0184***	(0.004)	-0.00944***	(0.003)	-0.00193	(0.003)	0.00254	(0.002)	0.00427**	(0.002)	0.0230**	(0.010)
60	-0.0238***	(0.005)	-0.0133***	(0.003)	-0.00382	(0.003)	0.00257	(0.002)	0.00511***	(0.002)	0.0332***	(0.011)
70	-0.0251***	(0.005)	-0.0126***	(0.004)	-0.00119	(0.004)	0.00484**	(0.002)	0.00711***	(0.002)	0.0269**	(0.012)
80	-0.0270***	(0.005)	-0.0141***	(0.004)	-0.00198	(0.004)	0.00483*	(0.003)	0.00743***	(0.002)	0.0308**	(0.014)
90	-0.0218***	(0.006)	-0.0109**	(0.004)	-0.00139	(0.004)	0.00379	(0.003)	0.00577**	(0.002)	0.0246*	(0.015)
99	-0.0207***	(0.007)	-0.00984**	(0.005)	-0.000553	(0.005)	0.00408	(0.003)	0.00581**	(0.003)	0.0212	(0.016)
HH wealth decile (baseline p.10)												
20	-0.0177***	(0.003)	-0.0215***	(0.004)	-0.0203***	(0.004)	-0.00753***	(0.002)	-0.000736	(0.001)	0.0677***	(0.012)
30	-0.0274***	(0.004)	-0.0285***	(0.004)	-0.0235***	(0.005)	-0.00693***	(0.002)	0.00147	(0.002)	0.0848***	(0.013)
40	-0.0345***	(0.004)	-0.0342***	(0.005)	-0.0263***	(0.005)	-0.00658***	(0.002)	0.00317*	(0.002)	0.0983***	(0.014)
50	-0.0333***	(0.005)	-0.0373***	(0.006)	-0.0334***	(0.005)	-0.0119***	(0.003)	-0.000814	(0.002)	0.117***	(0.016)
60	-0.0366***	(0.006)	-0.0444***	(0.006)	-0.0435***	(0.006)	-0.0181***	(0.003)	-0.00491**	(0.002)	0.147***	(0.018)
70	-0.0480***	(0.006)	-0.0526***	(0.007)	-0.0455***	(0.007)	-0.0154***	(0.003)	-0.000231	(0.002)	0.162***	(0.020)
80	-0.0483***	(0.006)	-0.0531***	(0.008)	-0.0462***	(0.008)	-0.0158***	(0.004)	-0.000540	(0.002)	0.164***	(0.023)
90	-0.0534***	(0.007)	-0.0584***	(0.009)	-0.0498***	(0.009)	-0.0163***	(0.004)	0.000410	(0.003)	0.177***	(0.026)
99	-0.0592***	(0.007)	-0.0667***	(0.010)	-0.0586***	(0.010)	-0.0204***	(0.005)	-0.00132	(0.003)	0.206***	(0.030)
Know account balance (baseline don't know)												
Rough idea	0.00276	(0.003)	0.00247	(0.003)	0.00210	(0.002)	0.000854	(0.001)	0.000289	(0.000)	-0.00847	(0.009)
I know exactly	0.00489	(0.003)	0.00433	(0.003)	0.00367	(0.003)	0.00147	(0.001)	0.000478	(0.000)	-0.0148	(0.011)

Buy on credit (baseline agree)												
Neither	-0.00825***	(0.003)	-0.00704***	(0.002)	-0.00579***	(0.002)	-0.00220***	(0.001)	-0.000545***	(0.000)	0.0238***	(0.008)
Tend to disagree	-0.00983***	(0.003)	-0.00845***	(0.002)	-0.00699***	(0.002)	-0.00268***	(0.001)	-0.000696***	(0.000)	0.0286***	(0.007)
Strongly disagree	-0.00890***	(0.003)	-0.00761***	(0.002)	-0.00628***	(0.002)	-0.00239***	(0.001)	-0.000605***	(0.000)	0.0258***	(0.008)
Patience (baseline £1,000 today)												
£1,100 next year	-0.00583***	(0.002)	-0.00524***	(0.002)	-0.00448***	(0.002)	-0.00182***	(0.001)	-0.000598***	(0.000)	0.0180***	(0.006)
Play safe with savings (baseline strongly agree)												
Agree	-0.000926	(0.001)	-0.000812	(0.001)	-0.000685	(0.001)	-0.000273	(0.000)	-0.0000848	(0.000)	0.00278	(0.004)
Neither	0.0000523	(0.002)	0.0000457	(0.002)	0.0000384	(0.002)	0.0000152	(0.001)	0.00000462	(0.000)	-0.000156	(0.007)
Disagree	0.0000938	(0.003)	0.0000820	(0.002)	0.0000689	(0.002)	0.0000273	(0.001)	0.00000829	(0.000)	-0.000280	(0.008)
Risk for good return (baseline strongly agree)												
Agree	0.000254	(0.002)	0.000222	(0.002)	0.000187	(0.002)	0.0000742	(0.001)	0.0000229	(0.000)	-0.000761	(0.007)
Neither	-0.000929	(0.003)	-0.000816	(0.002)	-0.000689	(0.002)	-0.000275	(0.001)	-0.0000869	(0.000)	0.00280	(0.008)
Disagree	0.0000591	(0.003)	0.0000518	(0.003)	0.0000436	(0.002)	0.0000173	(0.001)	0.00000535	(0.000)	-0.000177	(0.009)
Income saved in last 2 years (baseline no)												
Yes	-0.0136***	(0.002)	-0.0127***	(0.002)	-0.0107***	(0.001)	-0.00410***	(0.001)	-0.00109***	(0.000)	0.0422***	(0.005)
Gender (baseline male)												
Female	0.000637	(0.001)	0.000559	(0.001)	0.000471	(0.001)	0.000188	(0.000)	0.0000582	(0.000)	-0.00191	(0.004)
Pred. probability	0.0686		0.1052		0.1478		0.1111		0.1099		0.4575	
Observations	31229		31229		31229		31229		31229		31229	

Clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the marginal effects after an income drop using a Mundlak-Chamberlain correlated-random-effects ordered-panel probit, for the options in each column. The variables included in the estimations were the financial resilience proxy, the income and wealth deciles, financial knowledge, risk profile, proactive actions toward financial resilience, and gender. Additionally, the regressions included socio-demographic control variables such as general health, level of anxiety, education level, economic activity, marital status, household size, and age group. The control variables, as well as the mean of all the variables and the wave time-fixed effects included in the regressions, are not reported in the table.

The following two sets of rows correspond to the effects of belonging to a particular income or wealth decile on the predicted probabilities. In line with what was expected, households belonging to higher income and wealth deciles had lower probabilities of not being able to make ends meet in less than 6 months and a higher probability of being able to do so for a longer time span. A remarkable difference between the two sets of variables is that the coefficients were more statistically significant and of higher magnitudes for the wealth distribution. These results indicate that wealthier households had access to more financial assets that they could liquidate and better access to short-term credit in order to mitigate the negative financial shock, as shown in figures 4.1, 4.2, and 4.3. This as well has important implications for the inequality debates as argued before.

After the income and wealth deciles groups, the table reports the financial knowledge variable. In this case, knowing the account balances did not result in being significant for the marginal effects of the response probabilities in any setting. This is a sign that having a buffer to bounce back from a negative income shock is more related to other categories of the financial resilience spectrum.

Moreover, the risk profile of households showed some remarkable results for each of the variables in this category. Preferences to buy on credit were highly statistically significant. Not agreeing to buy on credit reduced the probability of being in any of the groups that could make ends meet for less than six months between 0.1 and 1 pp whereas it increased the probability of making ends meet for more than a year in 2-3 pp (p-value < 0.01). Along the same lines, being more patient reduced the probability of landing in one of the first five groups as before and with a similar magnitude, and it increased the probability of belonging to the last group by around 2 pp.

Somewhat unexpectedly, playing safe with savings and the appetite for risk for good return were not statistically significant for any of the groups. This outcome implies that households' risk profiles and financial decisions with savings and investments were not relevant in the creation of financial buffers. Perhaps the reason for this is that income, wealth, credit demand preferences, and proactive financial decisions were more relevant in the sample. Households that saved a portion of their income during the previous 2 years were less likely (0.1-1.4 pp) to be in the first five columns and were 4.22 pp more likely to be in the last column. Finally, unlike the previous exercise, gender caused no differences after a negative income shock.

Moving to the next exercise, respondents were asked how much they agreed with the following statement: *I always make sure that I have money saved for a rainy day.* The four options included "Agree strongly," "Tend to agree," "Tend to disagree,"

and “Disagree strongly.” Table 4.5 contains the results of these estimations.<sup>25</sup> The relevance of this exercise stems from the fact that creating a financial buffer can make a considerable difference for vulnerable households, and it is one of the few policies that improve financial resilience (McKnight, 2019). According to the debt charity StepChange, “If every household in the UK had at least £1,000 in accessible savings, the number of households in problem debt could be reduced by 500,000” (The Treasury Committee – House of Commons, 2018, p. 26). The first row of this table shows that the financial resilience proxy resulted in being statistically significant at the 1% level in all four columns. Column (1) indicates that a change in 1 in the logarithmic short-term financial ratio increased the probability of strongly agreeing with the statement by 0.75 pp. Contrary to this, an increase of the same magnitude reduced the probability of being in any of the other options by around 0.2 to 0.3 pp. Once more, the financial resilience proxy showed a strong predictive capacity of financial resilience characteristics, such as creating a financial buffer (this exercise) for unexpected negative income shocks (analyzed above).

The next two blocks of variables correspond with the income and wealth deciles. No clear trend marked a difference across deciles in the first column. Although the coefficients tended to increase, they were not always statistically significant. They roughly went from 2 to 4 pp but were only significant at the 5% level for the second, sixth, and ninth deciles and at the 10% level for the third and top deciles. There were no significant coefficients in column (2), clearly separating the respondents who strongly agreed from those who did not. There was a marked trend observed in columns (3) and (4), particularly for the latter. The higher the income decile, the lower the probability of belonging to any of these columns. These coefficients varied between 0.7 and 2.0 pp and were almost always significant at the 1% level. These results show that poorer households were more likely to disagree with saving for a rainy day but differences in these results were not linear across deciles for the option of strongly agreeing to create a financial buffer. Curiously, wealth did not result as being relevant in almost any column for almost any decile group. This suggests that the decision to create a financial buffer did not differ markedly across the wealth distribution.<sup>26</sup> Nonetheless, a clear motivation still exists to work toward improving saving patterns for lower income families.

---

<sup>25</sup>Each group represented more than 5% of the respondents, ranging from 7.08% for the smallest group, up to 47.13% for the biggest group, fitting with the model requirements. The predicted probabilities for each group were 47.11, 34.12, 12.16, and 6.61%, respectively.

<sup>26</sup>In column (2) the seventh decile had a higher probability of tending to agree than the baseline case did, but this was not highly significant (p-value < 0.1). In column (4), the third, ninth, and top deciles were 0.75, 1.56, and 1.84 pp less likely to strongly disagree with the statement, compared with the lowest decile (p-value < 0.05).

**Table 4.5:** Saving for a rainy day and financial resilience (marginal effects)

	(1)		(2)		(3)		(4)	
	Agree strongly		Tend to agree		Tend to disagree		Disagree strongly	
Fin. Assets/Liab.	0.00750***	(0.001)	-0.00188***	(0.000)	-0.00263***	(0.000)	-0.00300***	(0.000)
HH inc. decile (baseline p.10)								
20	0.0198**	(0.009)	-0.00308	(0.006)	-0.00704**	(0.003)	-0.00967***	(0.004)
30	0.0174*	(0.010)	0.00172	(0.006)	-0.00698**	(0.003)	-0.0121***	(0.004)
40	0.00972	(0.011)	0.00838	(0.006)	-0.00520	(0.003)	-0.0129***	(0.004)
50	0.0181	(0.012)	0.00426	(0.007)	-0.00781**	(0.004)	-0.0146***	(0.005)
60	0.0298**	(0.013)	0.000138	(0.007)	-0.0117***	(0.004)	-0.0182***	(0.005)
70	0.0216	(0.014)	-0.00252	(0.008)	-0.00784*	(0.004)	-0.0112**	(0.005)
80	0.0208	(0.015)	0.00669	(0.008)	-0.00946*	(0.005)	-0.0180***	(0.006)
90	0.0417**	(0.016)	-0.00937	(0.009)	-0.0145***	(0.005)	-0.0178***	(0.006)
99	0.0329*	(0.018)	-0.00000140	(0.010)	-0.0130**	(0.006)	-0.0199***	(0.007)
HH wealth decile (baseline p.10)								
20	-0.00847	(0.013)	0.00422	(0.008)	0.00256	(0.004)	0.00169	(0.003)
30	0.0134	(0.014)	-0.000562	(0.008)	-0.00527	(0.004)	-0.00753**	(0.004)
40	0.00313	(0.015)	0.00201	(0.008)	-0.00164	(0.005)	-0.00349	(0.004)
50	-0.00138	(0.016)	0.00937	(0.009)	-0.00136	(0.005)	-0.00663	(0.005)
60	-0.000321	(0.018)	0.00653	(0.010)	-0.00118	(0.006)	-0.00503	(0.006)
70	-0.0133	(0.020)	0.0179*	(0.010)	0.00178	(0.007)	-0.00632	(0.006)
80	0.000562	(0.023)	0.0114	(0.011)	-0.00266	(0.007)	-0.00930	(0.007)
90	0.00933	(0.026)	0.0132	(0.012)	-0.00700	(0.009)	-0.0156**	(0.008)
99	0.0207	(0.029)	0.00850	(0.014)	-0.0108	(0.010)	-0.0184**	(0.009)
Know account balance (baseline don't know)								
I have a rough idea	0.0305***	(0.010)	-0.0101***	(0.003)	-0.0103***	(0.003)	-0.0102***	(0.004)
I know exactly	0.0561***	(0.012)	-0.0195***	(0.004)	-0.0186***	(0.004)	-0.0180***	(0.004)

Buy on credit (baseline agree)								
Neither agree nor disagree	-0.00926	(0.009)	0.00314	(0.003)	0.00313	(0.003)	0.00299	(0.003)
Tend to disagree	-0.00837	(0.009)	0.00285	(0.003)	0.00283	(0.003)	0.00270	(0.003)
Strongly disagree	0.0319***	(0.010)	-0.0117***	(0.004)	-0.0106***	(0.003)	-0.00958***	(0.003)
Patience (baseline £1,000 today)								
£1,100 next year	0.0171**	(0.007)	-0.00629**	(0.003)	-0.00563**	(0.002)	-0.00516**	(0.002)
Play safe with savings (baseline strongly agree)								
Agree	-0.0658***	(0.005)	0.0251***	(0.002)	0.0216***	(0.002)	0.0191***	(0.001)
Neither agree nor disagree	-0.0704***	(0.008)	0.0266***	(0.003)	0.0231***	(0.003)	0.0206***	(0.002)
Disagree	-0.0414***	(0.010)	0.0165***	(0.004)	0.0134***	(0.003)	0.0115***	(0.003)
Risk for good return (baseline strongly agree)								
Agree	-0.0239***	(0.008)	0.00895***	(0.003)	0.00781***	(0.003)	0.00711***	(0.002)
Neither agree nor disagree	-0.0343***	(0.010)	0.0126***	(0.004)	0.0113***	(0.003)	0.0104***	(0.003)
Disagree	-0.00919	(0.011)	0.00353	(0.004)	0.00299	(0.003)	0.00267	(0.003)
Income saved in last 2 years (baseline no)								
Yes	0.103***	(0.007)	-0.0374***	(0.003)	-0.0361***	(0.003)	-0.0296***	(0.002)
Gender (baseline male)								
Female	0.00118	(0.005)	-0.000425	(0.002)	-0.000387	(0.001)	-0.000363	(0.001)
Predicted probability	0.4711		0.3412		0.1216		0.0661	
Observations	30938		30938		30938		30938	

Clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the marginal effects of the level of agreement with creating a financial buffer using a Mundlak-Chamberlain correlated-random-effects ordered-panel probit, for the options in each column. The variables included in the estimations were the financial resilience proxy, the income and wealth deciles, financial knowledge, risk profile, proactive actions toward financial resilience, and gender. Additionally, the regressions included socio-demographic control variables such as general health, level of anxiety, education level, economic activity, marital status, household size, and age group. The control variables, as well as the mean of all the variables and the wave time-fixed effects included in the regressions, are not reported in the table.

The next financial resilience dimension reported in the table is financial knowledge, proxied as before by awareness of the account balance. Unlike in previous exercises, having a rough idea and knowing exactly the account balance were extremely important predictors of the probability of strongly agreeing to save for a rainy day, with coefficients of 3.05 and 5.61 pp, respectively ( $p\text{-value} < 0.01$ ). Along the same lines, having this knowledge reduced the probability of being in any other group between 1 and 2 pp (columns (2) to (4) significant at the 1% level).

Furthermore, households' risk preferences revealed some thought-provoking results. First, the attitude toward credit purchases was significant only for those who strongly disagreed compared with respondents who agreed. For households that strongly disagreed with buying on credit, there was a 3.19 pp higher probability of strongly agreeing to save for a rainy day and around 1 pp lower probability of being in any of the other 3 columns (all significant at the 1% level). Second, being more patient resulted in a higher likelihood of 1.71 pp of being in column (1) and again a lower likelihood of around 0.6 pp of being in any other column (significant at the 5% level). Third, being less conservative with savings decreased the probability of strongly agreeing to create a financial buffer considerably, between around 4 and 7 pp, but increased the probability of being in any other response by between 1 and 4 pp (all  $p\text{-values} < 0.01$ ). Finally, agreeing (but not strongly) or being indifferent to assuming risk for good return had similar effects, making it less likely to strongly agree with saving for a rainy day by 2.39 and 3.43 pp, respectively, and increasing the probability of being in other columns (all  $p\text{-values} < 0.01$ ). Altogether, households that were more averse to using credit, more patient, conservative with savings, and more likely to demand risk for good return had a higher probability of strongly agreeing with creating financial buffers.

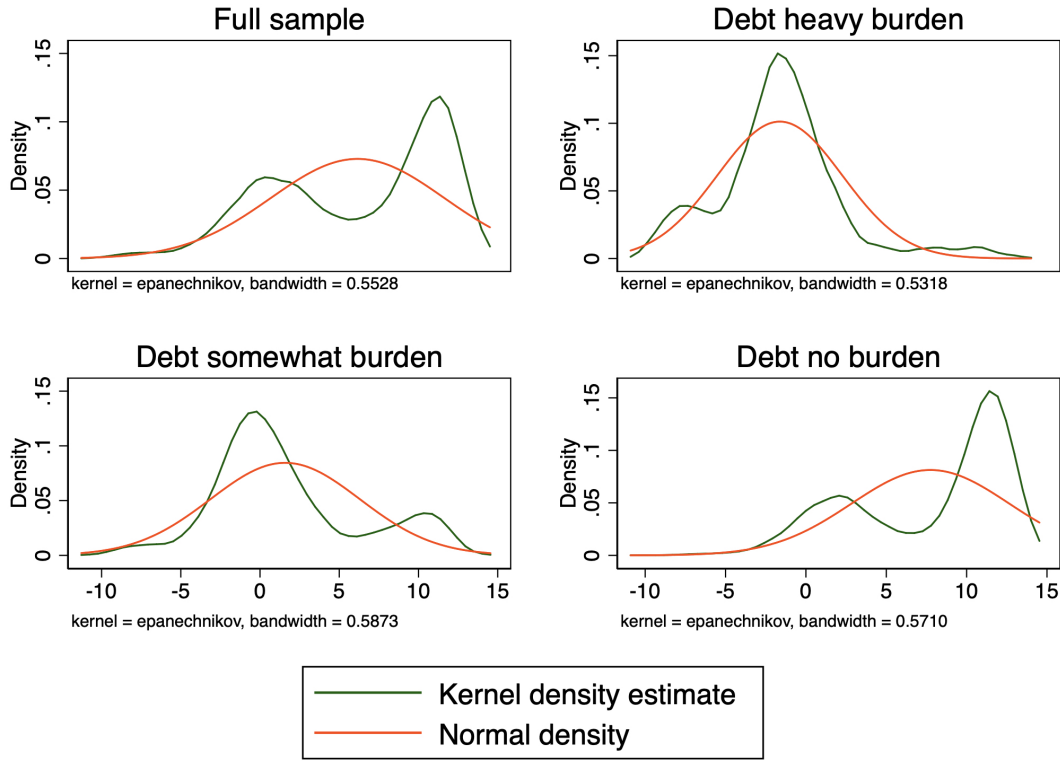
The final financial resilience dimension the table reports is the proactive actions taken toward creating financial resilience, proxied by whether respondents had saved any income during the last 2 years. As one would expect, this variable is highly correlated with the level of agreeing to saving for a rainy day, and therefore one can see that households that had saved income in the previous 2 years were 10.3 pp more likely to strongly agree with creating a financial buffer. Moreover, these households depicted a lower probability of being in any of the other columns of around 3 to 4 pp ( $p\text{-value} < 0.01$ ). All of the previous results align with those found in section 4.5.2. Finally, there were no differences for female respondents in the degree to which they agreed to saving for a rainy day. This is in line with previous evidence of men and women showing similar behavior for saving at financial institutions ([Demirgüç-Kunt et al., 2018](#)).



The last exercise of this section analyzed households' response to the following question: *Thinking about the (overdraft(s)/credit card(s)/store card(s)/ credit agreement(s)/loan(s)/bill payments) you have just told me about, to what extent is keeping up with the repayment of them and any interest payments a financial burden to you? Would you say it was...* The three options were "Heavy burden," "Somewhat a burden," and "No burden at all." The motivation for this analysis comes from the fact that access to consumer credit increases financial resilience, up to the point where over-indebtedness and financial stress becomes a reality.

To begin with, figure 4.5 renders the kernel distribution of the logarithmic financial ratio for the full sample, and then for each one of the groups according to the level at which short-term debt represents a burden. The full sample, depicted in the upper-left panel, shows a bimodal distribution as commented on section 4.3.2. The two maxima of the distribution are located around 0, where the value of the household's assets equal the value of the short-term liabilities, and then to the right tail of the distribution, where households had financial assets that were worth several times the value of their outstanding consumer credit. The most staggering fact from the figure is the difference in the distribution between the upper-right and bottom-right panels. Households that reported their outstanding short-term debts as a heavy burden had on average a negative logarithmic financial ratio, meaning that their short-term commitments were higher than their financial assets. Contrary to this, households for which this debt was not a problem had a distribution that was considerably skewed to the right. Nonetheless, there was still a significant number of households (bump to the left tail of the distribution) for which liabilities were around the same value as their financial assets. Moreover, in the bottom-left panel, one finds that for households whose short-term debt was somewhat a burden, the value of their financial assets was on average lower than the value of their consumer credit commitments, but there were some (bump toward the right tail of the distribution) that had financial assets worth several times their liabilities. This evidences that the financial resilience proxy is an important predictor of the degree to which debt can become a burden but that there are also some other important factors that must be taken into account.

**Figure 4.5:** Distribution of Logarithmic Financial Ratio



Note: this figure presents the Kernel distribution of the financial resilience proxy for the full sample and for subsamples according to the level to which respondents found consumer debt repayments a financial burden.

To do so, this chapter studies the differences across several household characteristics to disentangle the attributes that can predict when short-term debt constitutes a burden. This exercise analyzed the effects of households receiving financial advice proactively or rather due to a bad debt (Collins & O’rourke, 2010) in addition to the variables considered in all previous specifications of the estimated equations. Table 4.6 contains the results of these estimations.<sup>27</sup> As with all the estimations presented in this study, the logarithmic financial ratio resulted in being statistically significant at the 1% level. This confirms that the financial resilience proxy is capable of predicting several aspects of the British households’ financial resilience spectrum. In this case, the first column shows that an increase of 1 in the short-term logarithmic financial ratio lowered the probability of consumer debt repayments being a heavy

<sup>27</sup>Each group represented more than 5% of the respondents, ranging from 6.80% for the smallest group, up to 76.98% for the biggest group, fitting with the model requirements. The predicted probabilities for each group were 6.07, 15.45, and 78.48%, respectively.

burden by 0.48 pp, whereas column (2) indicates that the probability of debt repayments becoming somewhat a burden decreased by 0.66 pp. More importantly, this change also increased the probability of short-term debt not being a problem at all by 1.13 pp. Therefore, maintaining access to consumer credit and adjusting the short-term financial ratio when households might be less resilient, can reduce the likelihood of falling into distress, and afterward, improve the response to negative external shocks.

**Table 4.6:** Debt burden and financial resilience (marginal effects)

	(1)		(2)		(3)	
	Heavy burden		Somewhat burden		No burden at all	
Fin. Assets/Liab.	-0.00475***	(0.000)	-0.00660***	(0.000)	0.0113***	(0.001)
HH inc. decile (baseline p.10)						
20	-0.0196***	(0.005)	-0.0237***	(0.006)	0.0433***	(0.011)
30	-0.0151***	(0.006)	-0.0179***	(0.006)	0.0330***	(0.012)
40	-0.0252***	(0.006)	-0.0314***	(0.007)	0.0567***	(0.013)
50	-0.0306***	(0.006)	-0.0392***	(0.008)	0.0698***	(0.014)
60	-0.0283***	(0.007)	-0.0359***	(0.008)	0.0642***	(0.015)
70	-0.0287***	(0.007)	-0.0364***	(0.009)	0.0652***	(0.017)
80	-0.0374***	(0.008)	-0.0498***	(0.010)	0.0872***	(0.018)
90	-0.0317***	(0.009)	-0.0408***	(0.011)	0.0724***	(0.019)
99	-0.0430***	(0.009)	-0.0590***	(0.012)	0.102***	(0.021)
HH wealth decile (baseline p.10)						
20	-0.00758	(0.005)	-0.0103	(0.006)	0.0179	(0.011)
30	-0.0121**	(0.005)	-0.0168**	(0.008)	0.0289**	(0.013)
40	-0.0118*	(0.006)	-0.0164*	(0.009)	0.0281*	(0.015)
50	-0.0210***	(0.007)	-0.0306***	(0.011)	0.0516***	(0.018)
60	-0.0179**	(0.008)	-0.0257**	(0.012)	0.0436**	(0.020)
70	-0.0261***	(0.009)	-0.0391***	(0.014)	0.0652***	(0.023)
80	-0.0263***	(0.010)	-0.0394**	(0.016)	0.0657**	(0.026)
90	-0.0252**	(0.011)	-0.0375**	(0.017)	0.0627**	(0.028)
99	-0.0350***	(0.011)	-0.0554***	(0.020)	0.0904***	(0.031)
Received financial advice (baseline no)						
Yes	-0.0117***	(0.004)	-0.0171***	(0.006)	0.0288***	(0.009)
Received advice due to bad debt (baseline yes)						
No	-0.0373***	(0.010)	-0.0448***	(0.011)	0.0821***	(0.021)
Know account balance (baseline don't know)						
I have a rough idea	0.00663	(0.004)	0.00930	(0.006)	-0.0159	(0.011)
I know exactly	0.00232	(0.005)	0.00332	(0.008)	-0.00564	(0.013)
Buy on credit (baseline agree)						
Neither agree nor disagree	-0.00811**	(0.004)	-0.0113**	(0.005)	0.0194**	(0.008)
Tend to disagree	-0.00447	(0.004)	-0.00609	(0.005)	0.0106	(0.009)
Strongly disagree	-0.00622	(0.004)	-0.00856	(0.006)	0.0148	(0.010)

Patience (baseline £1,000 today)						
£1,100 next year	-0.00825***	(0.003)	-0.0119**	(0.005)	0.0202**	(0.008)
Play safe with savings (baseline strongly agree)						
Agree	0.000449	(0.002)	0.000622	(0.003)	-0.00107	(0.006)
Neither agree nor disagree	0.00379	(0.004)	0.00518	(0.005)	-0.00897	(0.009)
Disagree	-0.00688	(0.004)	-0.00991	(0.006)	0.0168	(0.011)
Risk for good return (baseline strongly agree)						
Agree	0.00627*	(0.003)	0.00914*	(0.005)	-0.0154*	(0.009)
Neither agree nor disagree	0.0108***	(0.004)	0.0154**	(0.006)	-0.0263**	(0.010)
Disagree	0.00862*	(0.005)	0.0124*	(0.007)	-0.0210*	(0.012)
Income saved in last 2 years (baseline no)						
Yes	-0.0213***	(0.003)	-0.0325***	(0.005)	0.0537***	(0.008)
Gender (baseline male)						
Female	0.00146	(0.002)	0.00204	(0.003)	-0.00350	(0.005)
Predicted probability	0.0607		0.1545		0.7848	
Observations	18922		18922		18922	

Clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table presents the marginal effects of the level to which consumer debt repayments are a burden using a Mundlak-Chamberlain correlated-random-effects ordered-panel probit, for the options in each column. The variables included in the estimations were the financial resilience proxy, the income and wealth deciles, seeking financial advice proactively or due to bad debt, financial knowledge, risk profile, proactive actions toward financial resilience, and gender. Additionally, the regressions included socio-demographic control variables such as general health, level of anxiety, education level, economic activity, marital status, household size, and age group. The control variables, as well as the mean of all the variables and the wave time-fixed effects included in the regressions, are not reported in the table.

The subsequent sets of variables are the income and wealth decile groups. Both sets depict very clear and marked results that highlight fundamental inequalities across the income and wealth distribution in terms of the degree to which short-term debt was a burden for households. In both cases, there was a linear trend in terms of the coefficients' magnitude with a sustained statistical significance.<sup>28</sup> Overall, there was a lower probability of considering consumer debt repayments somewhat or a heavy burden (columns (2) and (1), respectively) for better-off households, ranging from around 1.2 pp for the lower deciles and up to 6.0 pp for the higher deciles for both the income and wealth distribution variables. Additionally, there was a higher probability of not having any problems with debt repayments of between 2.9 and 10.2 pp (column (3)). By comparing these magnitudes to other variables'

<sup>28</sup>The p-value  $< 0.01$  for all the coefficients of the income deciles and were significant for the wealth deciles at the 5 and 1% level for almost all cases, except for the second decile, where there was no statistical significance, and the fourth decile, where the p-value  $< 0.1$ .

effects, it can be seen that there is a thorough need for understanding why these differences exist and why the poorest and more vulnerable households struggle with debt repayments, after a broad range of additional characteristics have first been considered.

Furthermore, the estimations show that financial advice played an important role in households' financial distress. Receiving financial advice proactively reduced the probability of debt repayments being a heavy burden and somewhat a burden by 1.17 pp and 1.71 pp, respectively, while increasing the probability of not having problems with these repayments by 2.88 pp (p-value < 0.01). On the contrary, not receiving advice due to bad debt had a coefficient of -0.04 in columns (1) and (2) and of 0.08 in column (3), signaling a high correlation, which was significant at the 1% level, between seeking advice in this situation and short-term debt being a burden.<sup>29</sup>

Turning to the financial knowledge proxy, the table reports that there were no significant effects of knowing the account balance in any of the three options of debt burden. In contrast, the risk preferences of respondents uncovered some remarkable results. Preference to buy on credit resulted in being statistically significant (p-value < 0.05) only when households were indifferent as opposed to agreeing with buying on credit. There was a lower probability of 0.8 pp and 1.1 pp of finding short-term debt repayments a heavy burden or somewhat a burden, respectively. Moreover, there was an increase of 1.9 pp in the probability of not finding these commitments a problem for this group. Patience seemed to have served respondents well, as one observes that the patience proxy showed a decrease in the probability of seeing repayments as a burden (0.83 pp in column (1) and 1.19 in column (2), with p-values < 0.01 and < 0.05, respectively). Additionally, it displayed an increase of 2.02 pp in the probability of debt not being a burden, at the 5% level of significance. As for attitudes toward savings, there were no statistically significant coefficients displaying any differences across level of conservativeness with savings. In addition, there was a marked difference only for risk-neutral households instead of other preferences toward taking on risk for good return. For this group, there was a higher probability of 1.08 pp (p-value < 0.01) of finding short-term debt repayments a heavy burden and somewhat a burden of 1.54 pp (p-value < 0.05), whereas there was a lower probability of consumer debt repayments not being a problem of 2.63 pp at the 5% level.<sup>30</sup> Overall, households that proactively sought financial advice while debt was

---

<sup>29</sup>It is important to acknowledge the possible reverse causality with this variable, as households that received advice due to bad debt were already perceiving debt repayments as a burden. Nonetheless, one could also expect that the advice received due to bad debt could have helped households to reorganize their liabilities and therefore reduce the level to which their commitments generated financial stress.

<sup>30</sup>For the other categories, agreeing and disagreeing, there were similar effects in terms of direc-

not a burden, were indifferent to making credit purchases, had a lower marginal propensity to consume, and were not risk neutral were more likely not to have problems with non-mortgage debt and interest repayments.

Finally, proactive actions taken toward financial resilience seemed to have had an important effect on the events analyzed as earlier. Having saved income in the last 2 years significantly reduced the probability of consumer debt repayments being a heavy burden by 2.13 pp and of being somewhat a burden by 3.25 pp. Additionally, there was an increase in the probability of not having any issues of 5.37 pp (all results significant at the 1% level). Finally, gender did not play any role in the level to which these liabilities created financial stress for British households.

This section examined three different scenarios and analyzed the effects of the short-term financial ratio on the occurrence probability of these, controlling for factors such as income and wealth distributions, households' financial knowledge, the agents' risk profiles, proactive actions taken toward improving financial resilience, and gender. The primary result is that the financial resilience proxy was always highly statistically and economically significant in determining the predictability of the dependent variables. Moreover, it is always important to look at a broad range of financial resilience dimensions, as for different events and shocks, there are alternative factors that become more relevant and play more significant roles. The next section summarizes the main results found in the previous exercises, concludes, and suggests possible lines for future research.

## 4.6 Summary

This study analyzed in depth several aspects of British households' financial resilience (i.e., the capability of households to bounce back from negative financial shocks). Specifically, this chapter first revised the recent and almost nascent literature on financial resilience and the debate around the best way in which it can be measured (section 4.2). The overall consensus in the literature is that, to date, there is no unique measurement that can capture all the dimensions that encompass financial resilience. Nonetheless, there is a coherent level of agreement around the skills, attitudes, and behaviors involved in determining households' financial resilience level. The literature seems to agree that four dimensions relate to financial resilience. The four components of a financial resilience framework ought to include economic resources, financial products and services, financial knowledge and behavior, and social capital. All these relate to but go beyond financial inclusion, via  

---

tion and magnitude, but these were significant only at the 10% level.

financial education, to improve financial literacy, capability, and acuity.

Second, the author moved into describing the data set implemented in the analysis, arguing the need for a measurement that could capture the dynamic nature of financial resilience in an all-encompassing way. This would thus highlight the advantages of exploiting a survey from which one can build a longitudinal panel that contains a vast amount of detailed information regarding individuals and households' characteristics, preferences, current situation, expectations, and more (section 4.3.1). Furthermore, section 4.3.2 presented graphic evidence of inequalities in access to financial assets and of liabilities across the income and wealth distribution. Moreover, through a series of descriptive statistics and tests, the author looked into the evolution of households' physical, property, pension, and financial wealth in addition to physical and mental health and well-being, and household composition, reinforcing the virtues of a series of exercises that would take into account the distributional effects of a range of variables on the likelihood of exposure to financial distress and, more importantly, on the probability of households bouncing back from these difficulties. For this purpose, the chapter proposed as the most suitable measure of financial resilience the logarithmic-short-term financial ratio.

Third, this chapter presented the main set of equations that the author wanted to estimate and the different methods available to do so (section 4.4). To assess the effects of the financial resilience proxy on the probability of occurrence of four different events, there were six available methods. The four events under study included falling behind on bills, keeping up with bills, arriving at the end of the week or month without money, and having money left at the end of the period. The six methods to calculate the probability of occurrence of any of the events were divided into two, linear probabilistic models and index models. In the former, one could find panel fixed-effects, panel hybrid-random-effects, and panel correlated-random-effects models, whereas in the latter, the options were panel hybrid-random-effects probits, panel correlated-random-effects probits, and panel fixed-effects logistic index models (section 4.4.1). Moving on, section 4.5.1 compared the six alternatives and assessed whether the results varied among them. Overall there was a high degree of consistency in the significance, direction, and magnitude of the effects. Taking into account the benefits of using IM, the author favored the Mundlak-Chamberlain correlated-random-effects panel probit model to estimate all the subsequent equations.

Fourth, section 4.5.2 presented the main results from the analysis of the four binary-response-variables financial resilience events. The chapter found that an increase of 1 in the financial resilience proxy had an effect of -0.48 pp in the probability

of falling behind on bills, of 0.76 pp in the probability of keeping up with bills, of -0.80 pp in the probability of arriving at the end of the week or month without money, and of 0.89 pp in the probability of having money left at the end of the period, all of them with a p-value  $< 0.01$ . These results confirmed that the proposed measurement of financial resilience had a strong correlation and predictability power in all of the estimations. Moreover, there were important and significant differences in the effect of the logarithmic short-term financial ratio on the four events, across the income and wealth distributions, revealing the importance of access to immediate liquidity in times of financial distress. These differences indicated that poorer households could benefit more from small adjustments to this ratio, and therefore one of the main conclusions of this chapter is that it is of great importance to focus on delivering appropriate education that can increase knowledge and improve financial acuity and resilience for these families. The chapter also evaluated in great detail the preferences and risk profiles of respondents (Blais & Weber, 2006; Weber et al., 2002). Overall, households that were more patient and conservative with their savings but demanded risk for profit had a lower likelihood of falling into financial distress and higher probabilities of keeping up with their commitments and having liquidity surpluses. In the same way, proactive actions taken toward building financial resilience had positive effects on households' likelihood of avoiding distress in most cases. On a relevant note, there were gender inequalities in the probability of falling into financial distress that motivate the need for women to access financial education to improve their financial literacy, to heighten their financial acuity and, through that channel, increase their resilience.

Finally, this chapter extended the investigation to cover a broader range of the financial resilience framework. Specifically, the author studied the relationship between the financial resilience proxy and the likelihood of respondents having a financial buffer that covered a negative income shock for a series of periods of up to more than a year, making sure they always saved for a rainy day, and the extent to which the repayment of consumer credit and its interest turned into a financial burden (section 4.5.3). By using Mundlak-Chamberlain correlated-random-effects ordered probits, the author determined that the main conclusion was that the logarithmic financial assets to short-term financial liabilities ratio was significant in all specifications, showing once again that this measurement correlates strongly and serves as a thorough predictor of an encompassing and dynamic set of financial resilience features, controlling for variables such as the income and wealth distributions; households' financial knowledge; the respondents' risk profiles; proactive actions taken toward improving financial resilience; and gender (which was not significant in any



specification). Additionally, including all these control variables was important to different degrees in each one of the exercises. For example, seeking financial advice proactively before consumer credit turned into a financial burden lowered the occurrence probability of this event. Moreover, one of the most robust conclusions is that creating healthy proactive habits toward achieving financial resilience, such as regularly saving, was by far the most important characteristic in reducing the probability of falling into financial distress and increasing the probability of being financially resilient.

To conclude, there is a clear understanding that the accumulation of financial assets, particularly liquid assets, contributes to increased household financial resilience. A more controversial topic is where researchers stand on with regard to consumer credit, and this chapter provided evidence to support the following closing statement. Consumer credit is like the *Jian*, a double-edged ancient Asian sword that was one of the most powerful weapons in history. As with the sword, consumer credit can be an extremely strong resource and ally, if and only if, one knows how to wield it. On the contrary, lack of knowledge and expertise can prove to be tremendous disadvantages that turn this weapon against its unskilled user. If the double-edged sword is too heavy for its wielder, it will fall on them and hurt them demonstrably. Similarly, if the debt-to-income ratio is too high, or the financial resilience proxy too low, consumer credit will generate over-indebtedness that will hurt the individual or household, causing injuries that will transcend the financial spectrum and will affect the mental and physical health and well-being of British families (Bridges & Disney, 2010; M. Taylor et al., 2011). That is the reason financial inclusion, via access to affordable and fair credit and liquidity products, should go hand in hand with financial education so that improving financial literacy and resilience can create capabilities that consumer credit wielders can use in their favor.

This chapter did not cover one of the four financial resilience dimensions mentioned in the literature: access to social capital. The primary reason for this was that the data availability was not sufficient to incorporate this element, thus leaving an open research opportunity for the future. In addition, a natural and important next step in the financial resilience literature will be to estimate the optimal level of the financial resilience proxy that determines when a household is financially resilient and below which families are in a serious state of vulnerability. Beyond this, there is an important opportunity to implement public programs that aim to improve households' financial resilience (Hastings et al., 2013; Lusardi & Mitchell, 2014). Based on the results of the present study and building on the existing literature, said programs will need to incorporate measures that combine financial inclusion,

via access to affordable and fair liquidity and with financial education that bolsters financial literacy, capability, and acuity leading to achieve financial resilience.

# Chapter 5

## Conclusions

### 5.1 Main findings in empirical chapters

This dissertation covered the topic of consumer credit and its effects on the British economy and the British households. Chapter 2 offered an analysis of the economic effects of the enactment of the CCA74, the first comprehensive consumer protection tool of the British retail financial market. The analysis first constructed a new series for consumer credit and its cost, by bringing together primary and secondary sources. This new data set enabled an exploration of whether the introduction of the calculation and publication of the APR generated a structural break in the relationship between the price and volume of consumer credit. This was tested with a 2SLS econometric strategy using filtered data. This break resulted from the reduction in information asymmetries arising from the obscurity with which shopkeepers and financial institutions presented the true cost of lending to consumers. The analysis in chapter 2 also evaluated the response to a shock in consumer credit on inflation and households' savings. The government had been worried for decades that an uncontrolled increase in the demand for consumer credit would generate inflationary pressures and would motivate households to reduce their savings. A VAR analysis provided evidence suggesting that this was not the case and that consumer credit did not contribute to the surge in British inflation to its historical peak in 1975.

Chapter 3 explored the effects of consumer credit on household consumption across various expenditures and on household well-being. Empirical results suggested significant effects of using consumer credit on both utility-generating consumption (e.g., consumer durables and leisure goods) and on subsistence expenditures. These effects varied across the income distribution, being of higher magnitude for poorer households that used credit cards and hire-purchase agreements, thus showing the potential to reduce consumption inequality, at least in the short

term. The econometric results also unveiled a positive correlation between short-term debt-to-income ratios and expenditures on groceries and housing. Financing subsistence goods and services with consumer credit served as a strong signal that households were misusing these instruments. The same results also suggested that households might be likely to fall into over-indebtedness if they are regularly funding the demand for leisure goods through consumer credit. As a consequence, over-indebtedness can have serious repercussions on household well-being. To address this point, the chapter evaluated the effects of consumer credit on two self-reported measures of well-being. Using consumer credit did not have direct significant negative effects on household well-being. Nonetheless, the debt-to-income ratio, and therefore the possibility of becoming over-indebted, resulted in being an important predictor of the short- and long-term likelihood of becoming distressed.

Chapter 4 turned its attention to household financial resilience, a nascent topic in household finance. The research proposed an encompassing measure to capture several features of financial resilience and its dynamic nature. Proxying measures included the logarithmic short-term financial assets-to-liabilities ratio. Econometric tests of the predictability properties of the financial resilience proxy included dimensions of the financial resilience framework such as economic resources, financial products and services, financial knowledge, and behavior but did not include social capital due to lack of data. Empirical tests consisted of estimating the effect of the financial resilience proxy on four events. These were “falling behind with bills,” “keeping up with bills,” “arriving at the end of the week or month without money,” and “having money left at the end of the period.” The financial resilience proxy had a significant ability to predict these events. Additionally, it showed that poorer households could benefit more from small adjustments to this ratio, thus increasing their capacity to withstand negative shocks. Moreover, households that were patient but demanded risk for profit had a lower likelihood of falling into financial distress and higher probabilities of keeping up with their bills and ending the month with positive liquidity. Furthermore, proactive actions taken toward financial resilience helped households avoid falling into distress and helped them be more financially resilient. Consumer credit played a determinant role in financial resilience. Like a two-edged sword, consumer credit can aid its wielder if and only if the consumers are skilled and knowledgeable users, but if not, it can create over-indebtedness and financial distress and negatively affect their mental and physical health and well-being.

## 5.2 Limitations

It is important to acknowledge some limitations of this dissertation’s research. First, results from Chapter 2 point to the need for greater clarity on the extent to which British households use information provided by the APR to shop around and inform their decisions. It was not possible to analyze at the household level how people used and processed the information regarding the APR, and whether there were significant differences across groups, due to the structure of the data found in the archives. Further exploration of the archives, in particular of credit granters that possess disaggregated data at the individual or loan level, will shed an important light onto these matters.

A second significant issue, in chapter 3, is the importance of recognizing the need for experimental settings that can contribute further information and allow researchers to understand the causality from consumer credit to specific expenditure items. This will help better explain the extent to which households finance their subsistence expenses through consumer credit and whether this is related to their financial acuity. In this regard, it is vital to comprehend the difference between using consumer credit and becoming over-indebted. The former could have positive effects, particularly for poorer households, whereas the latter definitely increases financial struggle and mental health issues. In addition, randomized studies can inform researchers and policy makers, helping them define over-indebtedness more accurately. This will allow a thorough assessment of the effect of financial education on building financial acuity that effectively aids households in avoiding this struggle. Using a more precise definition and measure of over-indebtedness, particularly separating the long-term from the short-term debt components, will contribute to a deeper understanding of the role of consumer credit in strengthening financial resilience.

A third important caveat, in chapter 4, evolves around the possibility of endogeneity originated from reverse causality that can only be mitigated by developing 2SLS strategies in the random-effects correlated-panel probits. Currently, econometric methods do not allow researchers to isolate the direction of the causality using instrumental variables in probabilistic models that exploit longitudinal data. These models thus need to account for the idiosyncratic characteristics of the agents in the models. Likewise, estimating dynamic panel probabilistic models with fixed effects would be a natural next step, as these surveys collect more data. Developing more sophisticated econometric methods would open the possibility of evaluating the long-term effects of interventions on financial resilience while mitigating the presence of endogeneity and, therefore, producing consistent estimators. Combined, all

these challenges set the future path for research in consumer credit and household finance.

### **5.3 Final remarks, policy implications, and future areas of research**

In conclusion, this dissertation contributed to expanding the knowledge in a developing area of research, namely household finance, and in particular, consumer credit in the United Kingdom. Altogether, this thesis provided thorough research that confirms that a stable regulatory framework in financial markets enhances consumer protection, via the provision of useful information that enables agents to improve their decision-making processes and to shop around for better offers in consumer credit markets. Consequently, regulation should aim at reducing information asymmetries that result in financial frictions in consumer credit markets that deteriorate consumer protection. Moreover, the results from this research indicate that increases in the outstanding volumes of consumer credit might not create inflationary pressures nor reductions in the savings ratio. However, there is an important channel that policy needs to address. Households' over-indebtedness is a source of detriments in well-being that at the aggregated level can intensify the burden on the National Health System and through that path, affect the British economy.

Additionally, the thesis offered broad evidence of the benefits of granting access to cheap and fair short-term funding. On the one hand, consumer credit has the potential to reduce consumption inequality, by granting poorer households the possibility to increase their utility-increasing consumption in the short run. On the other hand, this access should be accompanied by training that improves households' financial management capabilities and healthy financial habits, such as proactively constructing a financial buffer (i.e., saving for a rainy day), to prevent financial hardship and over-indebtedness. To achieve this goal, policy can make use of the measure of financial resilience presented in this dissertation. Several econometric exercises verified that the financial resilience proxy highly correlates with several dimensions of the financial resilience framework. Furthermore, this measure showed strong predictability power to signal the likelihood of financial distress at an early stage and the capabilities of households to withstand negative income shocks such as the SARS-COV-2 pandemic during 2020. Likewise, the financial resilience proxy depicted desirable characteristics for public policy instruments, since movements in this measure affected vulnerable households more than better-off agents, allowing policymakers to better target their initiatives.

Future lines of research should aim to understand how households have used the APR to optimize their demand for consumer credit in recent decades, given the vast availability of consumer credit products and granters, particularly around the growing FinTech industry. Additionally, research should give special attention to studying how households make use of different alternatives of consumer credit across the income and wealth distribution, to determine to what extent some products are normal or inferior goods for certain households. This line of work can inform of the interchangeability of consumer credit alternatives and can additionally shed light on how households allocate consumer credit between subsistence and utility-generating consumption. That is to say, if households use consumer credit for purposes other than the optimization of their inter-temporal consumption path, then theories of consumption smoothing over the life cycle and the permanent income theory should be challenged and complemented. This area of research has the potential to answer a very complex question in household finance; *What is the optimum level of indebtedness?* Finally, there is room for improving the availability of econometric methods that allow the estimation of dynamic probabilistic panel regressions that account for the unobservable characteristics of agents in the panel and that allow researchers to control for the possibility of endogeneity, implementing instrumental variables. All in all, this thesis provided an encompassing study of consumer credit that brings valuable information to policymakers who aim to develop interventions that a) improve consumers' use of price signals in consumer credit markets; b) reduce consumption inequality while increasing well-being but not generating over-indebtedness and; c) strengthen households' skills to withstand and overcome negative external shocks.

# Bibliography

- Afonso, J. S., Morvant-Roux, S., Guérin, I., & Forcella, D. (2017). Doing good by doing well? Microfinance, self-regulation and borrowers' over-indebtedness in the Dominican Republic. *Journal of International Development*, 29(7), 919–935.
- Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2009). The age of reason: Financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 2009(2), 51–117.
- Agarwal, S., Liu, C., & Souleles, N. S. (2007). The reaction of consumer spending and debt to tax rebates—evidence from consumer credit data. *Journal of political Economy*, 115(6), 986–1019.
- Agarwal, S., Skiba, P. M., & Tobacman, J. (2009). Payday loans and credit cards: New liquidity and credit scoring puzzles? *American Economic Review*, 99(2), 412–17.
- Allison, P. D. (2009). *Fixed effects regression models* (Vol. 160). SAGE publications.
- Anderson, E., & Muir, K. (2018). Financial security and the influence of economic resources. *Understanding Financial Resilience. Centre For Social Impact. NAB*.
- Ando, A., & Modigliani, F. (1963). The “Life Cycle” hypothesis of saving: Aggregate implications and tests. *The American Economic Review*, 55–84.
- Atkinson, A., McKay, S., Collard, S., & Kempson, E. (2007). Levels of financial capability in the UK. *Public Money and Management*, 27(1), 29–36.
- Attanasio, O. P., & Pistaferri, L. (2016). Consumption inequality. *Journal of Economic Perspectives*, 30(2), 3–28.
- Ausubel, L. M. (1991). The failure of competition in the credit card market. *The American Economic Review*, 50–81.
- Aveyard, S., Corthorn, P., & O'Connell, S. (2018). *The Politics of Consumer Credit in the UK, 1938-1992*. Oxford University Press.
- Bank Rate no longer guide to finance house charges. (1970, April). *Financial Times*.
- Barwell, R., May, O., & Pezzini, S. (2006). The distribution of assets, income and liabilities across UK households: results from the 2005 NMG Research survey.



*Bank of England Quarterly Bulletin.*

- Bátiz-Lazo, B. (2004). Strategic alliances and competitive edge: Insights from Spanish and UK banking histories. *Business History*, 46(1), 23–56.
- Bátiz-Lazo, B., & Del Angel, G. A. (2016). The dawn of the plastic jungle: Lessons from the first credit card in Europe and North America, 1950–1975. *México: Fundación de Estudios Financieros.*
- Ben-Galim, D., & Lanning, T. (2010). Strength against shocks: Low income families and debt. *Institute for Public Policy Research.*
- Bertola, G., Disney, R., & Grant, C. B. (2006). *The economics of consumer credit.* MIT Press.
- Bertrand, M., & Morse, A. (2011). Information disclosure, cognitive biases, and payday borrowing. *The Journal of Finance*, 66(6), 1865–1893.
- Blais, A.-R., & Weber, E. U. (2006). A domain-specific risk-taking (dospert) scale for adult populations. *Judgment and Decision making*, 1(1).
- Böheim, R., & Taylor, M. P. (2000). My home was my castle: Evictions and repossessions in Britain. *Journal of Housing Economics*, 9(4), 287–319.
- Boleat, M. J. (2012). *Building Society Industry (RLE Banking and Finance)* (Vol. 3). Routledge.
- Bowden, S. (1990). Credit facilities and the growth of consumer demand for electric appliances in the 1930s. *Business History*, 32(1), 52–75.
- Bowden, S., & Collins, M. (1992). The Bank of England, industrial regeneration, and hire purchase between the wars. *The Economic History Review*, 45(1), 120–136.
- Bowden, S., & Offer, A. (1994). Household appliances and the use of time: The United States and Britain since the 1920s. *The Economic History Review*, 47(4), 725–748.
- Bridges, S., & Disney, R. (2010). Debt and depression. *Journal of Health Economics*.
- Bridges, S., Disney, R., & Henley, A. (2006). Housing wealth and the accumulation of financial debt: Evidence from UK households. In G. Bertola, R. Disney, & C. Grant (Eds.), *The economics of consumer credit* (p. 135-180). MIT Press Cambridge, MA.
- Broughton, N., Kanabar, R., & Martin, N. (2015). Wealth in the downturn: Winners and losers. *Social Market Foundation.*
- Brown, C. (2008). *Inequality, consumer credit and the saving puzzle.* Edward Elgar Publishing.
- Brown, G. D., & Gathergood, J. (2020). Consumption changes, not income changes, predict changes in subjective well-being. *Social Psychological and Personality*

*Science*, 11(1), 64–73.

- Brown, S., Ghosh, P., & Taylor, K. (2014). The existence and persistence of household financial hardship: A Bayesian multivariate dynamic logit framework. *Journal of Banking & Finance*, 46, 285–298.
- Brown, S., Taylor, K., & Wheatley Price, S. (2005). Debt and distress: Evaluating the psychological cost of credit. *Journal of Economic Psychology*.
- Browning, M., & Crossley, T. F. (2001). The life-cycle model of consumption and saving. *Journal of Economic Perspectives*, 15(3), 3–22.
- Browning, M., & Lusardi, A. (1996). Household saving: Micro theories and micro facts. *Journal of Economic Literature*, 1797–1855.
- Bunn, P., & Rostom, M. (2016). Household debt and spending in the United Kingdom. In J. S. Chadha, A. Crystal, J. Pearlman, P. Smith, & S. Wright (Eds.), *The UK Economy in the Long Expansion and its Aftermath* (p. 244). Cambridge University Press.
- Burnett, G. D. (1971, June). *Letter to R. K. C. Giddings* (Vol. CLC/B/29/MS32264/1). London Metropolitan Archives, London, United Kingdom.
- Calder, L. (1999). *Financing the american dream: A cultural history of consumer credit*. Princeton University Press.
- Campbell, J. Y. (2006). Household finance. *The Journal of Finance*, 61(4), 1553–1604.
- Canova, F. (2007). *Methods for applied macroeconomic research* (Vol. 13). Princeton University Press.
- Carbó, S., Gardner, E., & Molyneux, P. (2005). *Financial exclusion*. Springer.
- Chamberlain, G. (1980). Analysis of covariance with qualitative data. *The Review of Economic Studies*, 47(1), 225–238.
- Christopherson, S., Michie, J., & Tyler, P. (2010). Regional resilience: Theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society*, 3(1), 3–10.
- Collins, J. M. (Ed.). (2016). *A fragile balance: Emergency savings and liquid resources for low-income consumers*. Springer.
- Collins, J. M., & O’rourke, C. M. (2010). Financial education and counseling—still holding promise. *Journal of Consumer Affairs*, 44(3), 483–498.
- Committee of London Clearing Banks. (1968). *Computation and disclosure of the rate of charge for consumer credit transactions* (Vol. CLC/B/M32259/6). London Metropolitan Archives, London, United Kingdom. (Informal note of discussion at the meeting of chief executive officers CLCB held at the BoE)

- Committee of London Clearing Banks. (1971). *Report of the Crowther Committee on consumer credit* (Vol. CLC/B/029/MS32264/001). London Metropolitan Archives, London, United Kingdom.
- Committee of London Clearing Banks. (1972). *Computation and disclosure of the rate of charge for consumer credit transactions* (Vol. CLC/B/029/MS32264/2). London Metropolitan Archives, London, United Kingdom. (Comments upon the Department of Trade and Industry's paper)
- Consoli, D. (2005a). The dynamics of technological change in UK retail banking services: An evolutionary perspective. *Research Policy*, 34(4), 461–480.
- Consoli, D. (2005b). Technological cooperation and product substitution in UK retail banking: The case of customer services. *Information Economics and Policy*, 17(2), 199–215.
- Crowther, G., et al. (1971). *Consumer credit: Report of the Committee* (Vol. 1). HMSO.
- Cynamon, B. Z., & Fazzari, S. M. (2013). Inequality and household finance during the consumer age. *Levy Economics Institute of Bard College, Annandale-on-Hudson, NY, Working Paper*(752).
- Danielian, N. R. (1929). The theory of consumers' credit. *The American Economic Review*, 393–411.
- Davies, R., Richardson, P., Katinaite, V., & Manning, M. J. (2010). Evolution of the UK banking system. *Bank of England Quarterly Bulletin*, Q4.
- Davoudi, S. (2012). Resilience: A bridging concept or a dead end? *Planning Theory & Practice*, 13(2), 299–307.
- de La Fuente, A. (2009). A mixed splicing procedure for economic time series. *CESifo Working Paper Series*.
- del Río, A., & Young, G. (2006). The determinants of unsecured borrowing: Evidence from the BHPS. *Applied Financial Economics*, 16(15), 1119–1144.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). Saving, credit, and financial resilience. In *The global index database 2017: Measuring financial inclusion and the fintech revolution*. World Bank.
- Department of Trade and Justice. (1973, March). *Voluntary code. Guidelines applicable to all loans individuals*. (Vol. CLC/B/029/M.32264/3). London Metropolitan Archives, London, United Kingdom.
- Deuflhard, F., Georgarakos, D., & Inderst, R. (2019). Financial literacy and savings account returns. *Journal of the European Economic Association*, 17(1), 131–164.
- Disney, R., Bridges, S., & Gathergood, J. (2008). Drivers of over-indebtedness.

*Report to the UK Department for Business.*

- Disney, R., & Gathergood, J. (2013). Financial literacy and consumer credit portfolios. *Journal of Banking & Finance*, 37(7), 2246–2254.
- Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior*. Harvard University Press.
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50(4), 1051–79.
- Duggan, A. (1986). Consumer credit rate disclosure in the United Kingdom and Australia: A functional and comparative appraisal. *International and Comparative Law Quarterly*, 35(01), 87–105.
- Durkin, T. A., Elliehausen, G., Staten, M. E., & Zywicki, T. J. (2014). *Consumer credit and the American economy*. Oxford University Press.
- Duygan-Bump, B., & Grant, C. (2009). Household debt repayment behaviour: What role do institutions play? *Economic Policy*, 24(57), 108–140.
- Dynan, K. E., Skinner, J., & Zeldes, S. P. (2004). Do the rich save more? *Journal of Political Economy*, 112(2), 397–444.
- Edmonds, T. (2018). High cost consumer credit: The new regulatory regime. *House of Commons Library*, Number CBP-07978.
- Fernandes, D., Lynch Jr., J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, 60(8), 1861–1883.
- Fernandez-Corugedo, E., & Muellbauer, J. (2006). Consumer credit conditions in the United Kingdom. *Bank of England Working Paper Series*(314).
- Finance Houses Association. (1971). *Initial memorandum on the report of the Crowther Committee on consumer credit* (Vol. CLC/B/029/MS32264/001). London Metropolitan Archives, London, United Kingdom.
- Financial Capability Strategy for the UK. (2018). Financial resilience during retirement: Who is well placed to cope with life events. *Age UK Love Later Life*.
- Finlay, S. (2009). *Consumer credit fundamentals* (Vol. 2). Palgrave Macmillan.
- Fisher, I. (1930). *The theory of interest* (Vol. 43). New York: The Macmillan Company.
- Fitch, C., Hamilton, S., Bassett, P., & Davey, R. (2011). The relationship between personal debt and mental health: A systematic review. *Mental Health Review Journal*.
- Friedman, M. (1957). *A theory of the consumption function*. Princeton University Press.

- Fulford, S. L. (2015). How important is variability in consumer credit limits? *Journal of Monetary Economics*, 72, 42-63.
- Fulford, S. L., & Schuh, S. D. (2015). Consumer revolving credit and debt over the life cycle and business cycle. *Federal Reserve Bank of Boston Working Paper Series*(15-17).
- Gathergood, J. (2012a). Debt and depression: Causal links and social norm effects. *The Economic Journal*.
- Gathergood, J. (2012b). Self-control, financial literacy and consumer over-indebtedness. *Journal of Economic Psychology*, 33(3), 590-602.
- Gathergood, J., & Guttman-Kenney, B. (2016). Can we predict which consumer credit users will suffer financial distress? *FCA Occasional Paper*(20).
- Gelpi, R.-M., & Julien-Labruyere, F. (2000). *The history of consumer credit: Doctrines and practice*. Palgrave Macmillan.
- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and why incentives (don't) work to modify behavior. *Journal of Economic Perspectives*, 25(4), 191-210.
- Goldberg, D. (1978). *Manual of the general health questionnaire*. NFER Nelson.
- Goldstein, D. G., Johnson, E. J., Herrmann, A., & Heitmann, M. (2008). Nudge your customers toward better choices. *Harvard Business Review*, 86(12), 99-105.
- Goode, R. M. (1975). The Consumer Credit Act 1974. *The Cambridge Law Journal*, 34(01), 79-130.
- Goode, R. M. (1979). *The Consumer Credit Act: A students' guide*. Butterworths.
- Goodhart, C. A. E. (2015). Competition and credit control: Some personal reflections. *Financial History Review*, 22(02), 235-246.
- Gross, D. B., & Souleles, N. S. (2002). Do liquidity constraints and interest rates matter for consumer behavior? Evidence from credit card data. *The Quarterly Journal of Economics*, 117(1), 149-185.
- Guiso, L., & Sodini, P. (2013). Household finance: An emerging field. In M. H. George M. Constantinides & R. M. Stulz (Eds.), *Handbook of the Economics of Finance* (Vols. 2, Part B, p. 1397 - 1532). Elsevier.
- Hadar, L., Sood, S., & Fox, C. R. (2013). Subjective knowledge in consumer financial decisions. *Journal of Marketing Research*, 50(3), 303-316.
- Hamilton, J. D. (1994). *Time series analysis* (Vol. 2). Princeton University Press.
- Hansard (Lords). (1972, June). (Vol. CCCXXXII). Hansard Archives of Parliamentary Debates.
- Hartropp, A. (1992). Demand for consumer borrowing in the UK, 1969-90. *Applied Financial Economics*, 2(1), 11-20.
- Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013). Financial literacy,

- financial education, and economic outcomes. *Annual Review of Economics*, 5(1), 347–373.
- Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Federal Reserve Bulletin*, 89, 309.
- Hill, R. J., & Fox, K. J. (1997). Splicing index numbers. *Journal of Business & Economic Statistics*, 15(3), 387–389.
- Hirshleifer, J. (1958). On the theory of optimal investment decision. *Journal of Political Economy*, 66(4), 329–352.
- Hodrick, R. J., & Prescott, E. C. (1997). Postwar US business cycles: An empirical investigation. *Journal of Money, Credit, and Banking*, 1–16.
- Hudon, M., Labie, M., & Szafarz, A. (2019). A long time ago in a galaxy far, far away... How microfinance evolved and how research followed. In *A research agenda for financial inclusion and microfinance*. Edward Elgar Publishing.
- Hyde, D. (1974). The Consumer Credit Act 1974. *Trade and Industry, CLC/B/29/M.32264/9*, 259–264, 333–335.
- Hyman, L. (2011). *Debtor nation: The history of America in red ink*. Princeton University Press.
- Hyman, L. (2012). *Borrow: The American way of debt*. Vintage Books.
- Innes, A. M. (1913). What is money? *The Banking Law Journal*.
- Jann, B. (2017). Center: Stata module to center (or standardize) variables. *Statistical Software Components S444102*.
- Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. *Journal of Banking & Finance*, 37(8), 2779–2792.
- Jenkins, R., Bhugra, D., Bebbington, P., Brugha, T., Farrell, M., Coid, J., ... Meltzer, H. (2008). Debt, income and mental disorder in the general population. *Psychological Medicine*, 38(10), 1485–1493.
- Juster, F. T., & Shay, R. P. (1964). Consumer sensitivity to finance rates: An empirical and analytical investigation. *National Bureau of Economic Research*, 6–46. (Occasional Paper 88)
- Kamleitner, B., & Kirchler, E. (2007). Consumer credit use: A process model and literature review. *Revue Europeenne de Psychologie Appliquee/European Review of Applied Psychology*, 57(4), 267–283.
- Karlan, D., & Zinman, J. (2009). Observing unobservables: Identifying information asymmetries with a consumer credit field experiment. *Econometrica*, 77(6), 1993–2008.
- Karlan, D., & Zinman, J. (2010). Expanding credit access: Using randomized supply

- decisions to estimate the impacts. *The Review of Financial Studies*, 23(1), 433–464.
- Kirchler, E., Hoelzl, E., & Kamleitner, B. (2008). Spending and credit use in the private household. *The Journal of Socio-Economics*, 37(2), 519–532.
- Kitson, M. (2004). Failure followed by success or success followed by failure? A re-examination of British economic growth since 1949. In R. Floud & P. Johnson (Eds.), *The Cambridge economic history of modern Britain* (Vols. 3. Structural Change and Growth, 1939-2000, p. 27-56). Cambridge University Press.
- Labie, M., Méon, P.-G., Mersland, R., & Szafarz, A. (2015). Discrimination by microcredit officers: Theory and evidence on disability in Uganda. *The Quarterly Review of Economics and Finance*, 58, 44–55.
- Lamb, L. (2016). Financial exclusion and financial capabilities in Canada. *Journal of Financial Economic Policy*.
- Lea, S. E., Webley, P., & Levine, R. M. (1993). The economic psychology of consumer debt. *Journal of economic psychology*, 14(1), 85–119.
- Lea, S. E., Webley, P., & Walker, C. M. (1995). Psychological factors in consumer debt: Money management, economic socialization, and credit use. *Journal of economic psychology*, 16(4), 681–701.
- Lee, J., & Kim, K. T. (2018). The increase in payday loans and damaged credit after the great recession. *Journal of Family and Economic Issues*, 39(2), 360–369.
- Logemann, J. (2012). *The development of consumer credit in global perspective: Business, regulation, and culture*. Palgrave Macmillan.
- Lusardi, A. (2010). Financial capability in the United States: Consumer decision-making and the role of social security. *Michigan Retirement Research Center Research Paper*, 2010-226.
- Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: How do women fare? *American Economic Review*, 98(2), 413–17.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5–44.
- Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics & Finance*, 14(4), 332–368.
- Lütkepohl, H. (2005). *New introduction to multiple time series analysis*. Springer Science & Business Media.
- Macalister, T. (2011, March). Background: What caused the 1970s oil price shock? *The Guardian*.
- MacKinnon, D., & Derickson, K. D. (2013). From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography*,

37(2), 253–270.

- Mallard, G. (2015). *Bounded rationality and behavioural economics*. Routledge.
- Manning, R. D. (2001). *Credit card nation: The consequences of America's addiction to credit*. Basic Books.
- May, O., & Tudela, M. (2005). When is mortgage indebtedness a financial burden to British households? A dynamic probit approach. *Bank of England Working Paper Series*.
- McKnight, A. (2019). Financial Resilience among EU households. *European Commission. Directorate-General for Employment, Social Affairs and Inclusion Social Situation Monitor*.
- Meier, S., & Sprenger, C. (2010). Present-biased preferences and credit card borrowing. *American Economic Journal: Applied Economics*, 2(1), 193–210.
- Melzer, B. T. (2011). The real costs of credit access: Evidence from the payday lending market. *The Quarterly Journal of Economics*, 126(1), 517–555.
- Metcalfe, J. L. (1982). Self regulation, crisis management and preventive medicine: The evolution of UK bank supervision. *Journal of Management Studies*, 19(1), 75–90.
- Mian, A., Rao, K., & Sufi, A. (2013). Household balance sheets, consumption, and the economic slump. *The Quarterly Journal of Economics*, 128(4), 1687–1726.
- Modigliani, F., & Ando, A. (1957). Tests of the life cycle hypothesis of savings: Comments and suggestions. *Bulletin of the Oxford University Institute of Economics & Statistics*, 19(2), 99–124.
- Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. Kurihara (Ed.), *Post-Keynesian economics* (p. 338-436). Rutgers University Press.
- Morse, A. (2011). Payday lenders: Heroes or villains? *Journal of Financial Economics*, 102(1), 28–44.
- Mottola, G. R. (2013). In our best interest: Women, financial literacy, and credit card behavior. *Numeracy*, 6(2), 1–15.
- Muir, K., Reeve, R., Connolly, C., Marjolin, A., Salignac, F., & Ho, K. (2016). Financial resilience in australia 2015. *Centre for Social Impact (CSI)–University of New South Wales, for National Australia Bank*.
- Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica: Journal of the Econometric Society*, 69–85.
- Noctor, M., Stoney, S., & Stradling, R. (1992). Financial literacy: A discussion of concepts and competences of financial literacy and opportunities for its introduction into young people's learning. *National Foundation for Educational*



*Research.*

- Nosal, J. B., & Drozd, L. A. (2011). *Competing for customers: A search model of the market for unsecured credit* (2011 Meeting Papers No. 1033). Society for Economic Dynamics.
- O’Connell, S. (2009a). The business of working-class credit. In J. Logemann (Ed.), *The development of consumer credit in global perspective*. Palgrave Macmillan.
- O’Connell, S. (2009b). *Credit and community: Working-class debt in the UK since 1880*. Oxford University Press.
- Offer, A. (2013, June). *Narrow banking, real estate, and financial stability in the UK, c.1870-2010* (Economics Series Working Papers No. Number 116). University of Oxford, Department of Economics.
- Offer, A. (2017). The market turn: from social democracy to market liberalism. *The Economic History Review*, 70(4), 1051–1071.
- Office for National Statistics. (2017). Wealth and assets survey user guide wave 5. *UK Data Archive, Number 7215*.
- Phillips, N. M. (1972, June). *Consumer Credit: The Crowther Report* (Vol. CC-CXXXII). Hansard Archives of Parliamentary Debates. (Intervention in parliamentary debate by Baroness Phillips)
- Pickford, J. (2020). Cash ISAs: only worth it for the wealthiest. *Financial Times*.
- Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press.
- Pollock, D. (2000). Trend estimation and de-trending via rational square-wave filters. *Journal of Econometrics*, 99(2), 317–334.
- Prados de la Escosura, L. (2014). Mismeasuring long run growth. The bias from spliced national accounts. *CEPR Discussion Paper No. DP10137*.
- Puri, M., Rocholl, J., & Steffen, S. (2011). Global retail lending in the aftermath of the US financial crisis: Distinguishing between supply and demand effects. *Journal of Financial Economics*, 100(3), 556–578.
- Reading, R., & Reynolds, S. (2001). Debt, social disadvantage and maternal depression. *Social Science & Medicine*.
- Reform of the law on consumer credit*. (1973). Parliamentary Papers.
- Remund, D. L. (2010). Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of consumer affairs*, 44(2), 276–295.
- Richardson, T., Elliott, P., & Roberts, R. (2013). The relationship between personal unsecured debt and mental and physical health: A systematic review and meta-analysis. *Clinical Psychology Review*.
- Roberts, J. A., & Jones, E. (2001). Money attitudes, credit card use, and compulsive

- buying among American college students. *Journal of Consumer Affairs*, 35(2), 213–240.
- Roodman, D. (2012). *Due diligence: An impertinent inquiry into microfinance*. CGD Books.
- Rubaszek, M., & Serwa, D. (2014). Determinants of credit to households: An approach using the life-cycle model. *Economic Systems*, 38(4), 572–587.
- Salignac, F., Marjolin, A., Reeve, R., & Muir, K. (2019). Conceptualizing and measuring financial resilience: A multidimensional framework. *Social Indicators Research*, 1–22.
- Samy, A. (2016). *The building society promise: Access, risk, and efficiency 1880–1939*. Oxford University Press.
- Sanches, D. (2011). A dynamic model of unsecured credit. *Journal of Economic Theory*, 146(5), 1941–1964.
- Schunck, R. (2013). Within and between estimates in random-effects models: Advantages and drawbacks of correlated random effects and hybrid models. *The Stata Journal*, 13(1), 65–76.
- Scott, P. (1996). The new alchemy: Veblen’s theory of crisis and the 1974 British property and secondary banking crisis. *Journal of Economic Issues*, 30(1), 1–11.
- Scott, P. (2002). The twilight world of interwar British hire purchase. *Past & Present*(177), 195–225.
- Scott, P. (2007). Consumption, consumer credit and the diffusion of consumer durables. In F. Carnevali & J.-M. Strange (Eds.), *20th Century Britain: Economic, Cultural and Social Change* (2nd ed., pp. 162–179). Routledge.
- Scott, P. (2008). Marketing mass home ownership and the creation of the modern working-class consumer in inter-war Britain. *Business History*, 50(1), 4–25.
- Scott, P., & Walker, J. (2010). Advertising, promotion, and the competitive advantage of interwar British department stores. *The Economic History Review*, 63(4), 1105–1128.
- Scott, P., & Walker, J. (2012a). The British ‘failure’ that never was? The Anglo-American ‘productivity gap’ in large-scale interwar retailing - evidence from the department store sector. *The Economic History Review*, 65(1), 277–303.
- Scott, P., & Walker, J. (2012b). Working-class household consumption smoothing in interwar Britain. *The Journal of Economic History*, 72(03), 797–825.
- Seligman, E. R. A. (1927). *The economics of instalment selling: A study in consumers’ credit*. New York: Harper. (2 vols)
- Servet, J.-M., et al. (2011). Corporate responsibility versus social performance

- and financial inclusion. *The Handbook of Microfinance*. Singapore: World Scientific, 301–23.
- Skinner, J. (2007). Are you sure you're saving enough for retirement? *Journal of Economic Perspectives*, 21(3), 59–80.
- Soll, J. B., Keeney, R. L., & Larrick, R. P. (2013). Consumer misunderstanding of credit card use, payments, and debt: Causes and solutions. *Journal of Public Policy & Marketing*, 32(1), 66–81.
- Speed-up of Credit Bill by Parliamentary staff. (1974, June). *Daily Telegraph*.
- Stango, V., & Zinman, J. (2009). Exponential growth bias and household finance. *The Journal of Finance*, 64(6), 2807–2849.
- Stango, V., & Zinman, J. (2011). Fuzzy math, disclosure regulation, and market outcomes: Evidence from truth-in-lending reform. *The Review of Financial Studies*, 24(2), 506–534.
- Stegman, M. A. (2007). Payday lending. *Journal of Economic Perspectives*, 21(1), 169–190.
- Sweet, E., Nandi, A., Adam, E. K., & McDade, T. W. (2013). The high price of debt: Household financial debt and its impact on mental and physical health. *Social Science & Medicine*.
- Taylor, A. (2002). *Working class credit and community since 1918*. Palgrave.
- Taylor, M. (2011). Measuring financial capability and its determinants using survey data. *Social Indicators Research*, 102(2), 297–314.
- Taylor, M., Jenkins, S., & Sacker, A. (2009). *Financial capability and wellbeing: Evidence from the BHPS*. Financial Services Authority UK.
- Taylor, M., Jenkins, S., & Sacker, A. (2011). Financial capability and psychological health. *Journal of Economic Psychology*, 32(5), 710–723.
- The Treasury Committee – House of Commons. (2018). Household finances: Income, saving and debt. *Nineteenth Report of Session 2017–19*.
- Thornely, J., & Ziegel, J. (1965). Hire-purchase reformed. *The Cambridge Law Journal*, 23(01), 59–92.
- Togba, E. L. (2012). Microfinance and households access to credit: Evidence from Côte d'Ivoire. *Structural Change and Economic Dynamics*, 23(4), 473–486.
- Tomlinson, J. (2004). Economic policy. In R. Floud & P. Johnson (Eds.), *The Cambridge Economic History of Modern Britain, III, Structural Change and Growth, 1939-2000* (p. 189-212). Cambridge University Press.
- Tufano, P. (2009). Consumer finance. *Annual Review of Financial Economics*, 1(1), 227–247.
- University of Essex – Institute for Social and Economic Research. (2010). *British*

- Household Panel Survey: Waves 1-18, 1991-2009. [data collection]* (7th Edition ed.) (No. SN: 5151). UK Data Service.
- University of Essex – Institute for Social and Economic Research, NatCen Social Research and Kantar Public [producers]. (2016). *Understanding Society: Waves 1-6, 2009-2015 [computer file]* (8th Edition ed.) (No. SN: 6614). UK Data Service [distributor].
- Vandone, D. (2009). The determinants of consumer credit: A review of the literature. In *Consumer credit in Europe* (pp. 7–22). Springer.
- Walker, J., & Cooper, M. (2011). Genealogies of resilience: From systems ecology to the political economy of crisis adaptation. *Security Dialogue*, 42(2), 143–160.
- Wallace, A., Jones, A., & Rhodes, D. (2014). Financial resilience and security: Examining the impact of falling housing markets on low income homeowners in Northern Ireland. *York: Centre for Housing Policy*.
- Weber, E. U., Blais, A.-R., & Betz, N. E. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *Journal of behavioral decision making*, 15(4), 263–290.
- Wild, S. (1973, October). *White paper on consumer credit*. (Vol. CLC/B/29/M32264/3). London Metropolitan Archives, London, United Kingdom. (Note of a meeting of the ad hoc committee held at CLCB)
- Willis, L. E. (2011). The financial education fallacy. *American Economic Review*, 101(3), 429–34.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.
- Wray, L. R. (1990). *Money and credit in capitalist economies*. Edward Elgar Publishing.
- Yergin, D., & Stanislaw, J. (2008). *The commanding heights: The battle between government and the marketplace*. Simon and Schuster.
- Ynesta, I., & De Queljoe, M. (2017). Statistical insights: What does household debt say about financial resilience? *OECD ECOSCOPE*.

# Appendices

# Appendix A

## Detailed historical narrative and statistical support for CCA74

### A.1 Further political, industrial, and regulatory background

#### A.1.1 A period of political and economic change

The 1970s was a very dynamic decade for the economic and political scene in the United Kingdom. It was precisely during this decade that Britain underwent a structural change that significantly altered its economic growth path significantly ([Kitson, 2004](#)). There was also a radical transformation in the leading economic paradigm. Economists and, later on, policy makers moved from Keynesianism (important government intervention) to a free market economy framework, as that proposed by Hayek decades earlier, primarily due to the economic crises that occurred both in the United Kingdom and the United States ([Yergin & Stanislaw, 2008](#)).

Economic crises and political turmoil were a constant worry for governments and the general population. The banking business in the United Kingdom had been traditionally and largely controlled by the cartel; the Committee of London Clearing Bankers (CLCB) used to fix rates and openly collude. The government was determined to end the cartel and effectively did so through the Competition and Credit Control Act 1971 ([Davies, Richardson, Katinaite, & Manning, 2010](#); [Goodhart, 2015](#)). This act promoted competition between financial intermediaries and between banks and non-bank financial institutions. An increase in the participation in the market by the “fringe” banks competing with the London and Scottish clearing banks resulted in the secondary banking crisis of 1973–1975 ([Davies et al., 2010](#)), showing a lack of effective supervision by the Bank of England ([Metcalf,](#)

1982; Scott, 2002).

Additionally, the country was experiencing several more problems. Inflation was rising and out of control, unemployment was increasing, and overall economic growth halted, causing “stagflation.” On top of that, this decade also saw the end of the Bretton Woods era and the oil crisis of 1973 (Kitson, 2004). Moreover, many working-class strikes (Yergin & Stanislaw, 2008) came together and created an overall crisis in the country. The government had to call for a general election just when the CCA74 was being debated. At that moment, the Conservative Party was in power with Edward Heath as the prime minister.

After the general election in 1974, a Labour government was elected and remained in power for the period 1974–1979. Harold Wilson and James Callaghan were the heads of the government during that period. During this government’s reign, and as a consequence of the oil crisis, a shortage in the supply of electricity and power in the United Kingdom arose, and the government was forced to shorten the working week to 3 days (Macalister, 2011). In 1979, a new Conservative government lead by Prime Minister Margaret Thatcher regained power. This election, and the series of political and economic reforms the new government announced, resulted in another shock to the country’s stability (Kitson, 2004). During this period, the United Kingdom witnessed the highest historical inflation rates, reaching more than 25%. Governments from both parties in the 1970s actively fought inflation. This was partially controlled before the Thatcher win, although there was a milder surge in inflation between the late 1970s and early 1980s. Inflation was finally controlled during the second half of the 1980s.

### **A.1.2 Consumer credit in the mid-20th century**

The Bank of England promoted the development of the hire-purchase market during the interwar period by directly purchasing shares of the United Dominion Trust.<sup>1</sup> The intervention was not ultimately as successful as the governor of the Bank of England, Montagu Norman, had envisaged. At the same time, the British department store sector was still expanding and adapting to the new managerial revolutions and changes brought by US department stores in the 1930s (Scott & Walker, 2012a). Specifically, UK department stores competed against chain stores, but were successful at staying afloat due to their advertising strategies (Scott & Walker, 2010). This explains in part how retail installment credit and hire-purchase credit significantly rose in the interwar period. In the United Kingdom, these types of agreements

---

<sup>1</sup>By the late 1920s, UDT accounted for about 50% of the hire purchase business in the country, excluding furniture (Bowden & Collins, 1992).

accounted for a considerable proportion of purchases of cars, sewing machines, and furniture (Finlay, 2009). Nonetheless, growth of hire-purchase agreements was not unproblematic, mainly because of the lack of regulation of these products and the advantage issuers took of this situation (Scott, 2002). The Hire-Purchase Act 1938 aimed at regulating these types of agreements, but it was not entirely effective. For this reason, terms controls, and further amendments to this act were needed (Thornely & Ziegel, 1965).

After WWII's conclusion, important growth of consumer and mortgage credit occurred (Finlay, 2009; Guiso & Sodini, 2013). Several factors determined the explosion of the growth rates of credit during this period. On the one hand, household income grew above the subsistence-level consumption basket. Moreover, the working class purchased homes, an idea strongly sold to it by the building societies (Scott, 2008). Highly correlated with the increase in home ownership in the United Kingdom was the demand for consumer durables, such as furniture, and because of that, an increase in the demand for consumer credit. Between the 1950s and 1980s, household-appliance ownership spread widely across the United Kingdom, with time-consuming goods spreading more rapidly than time-saving goods did (Bowden & Offer, 1994). There was evidence too that British working-class households were using consumer credit to smooth their consumption along the life cycle, particularly when starting new homes and with the birth of newborns (Scott & Walker, 2012b).

On the other hand, financial and retail institutions were more interested in financing household consumption because profits in this market were more attractive given the lower level of default risk. After the end of WWII, full employment, rising incomes, and the end of rationing in the early 1950s built up demand for consumption (Offer, 2013). Banks were trying to expand, seeking to maximize the benefits from the economies of scale and scope and responded by providing for the first time loans for consumption purposes (Davies et al., 2010; Offer, 2013). In the United Kingdom, it was not until Barclays introduced its credit card in 1966 (Bátiz-Lazo & Del Angel, 2016) that this instrument was made available. Nonetheless, due to choice or the conservative nature of the UK's banking industry, the working class was generally excluded from these markets (Finlay, 2009). Instead, a large proportion of British purchases of goods were carried out via mail order. In 1981, around 20 million people purchased through mail order every year, with half a million orders being placed each day (O'Connell, 2009b; A. Taylor, 2002).

It is also crucial to look at what was occurring vis-a-vis the regulatory environment surrounding banking activities. As Goodhart (2015) mentioned, during



the last quarter of 1969, discussions took place at the Bank of England to abolish both ceiling controls and the clearing banks' cartel, but with a counterweight meant to constrain banks from bidding for funds. During the 1970s, the government attempted to control credit through various mechanisms such as the Credit Control Act 1971, the hire-purchase controls, and many others; these included liquidity ratios on banks, special deposits, and directives and persuasions so building societies would limit lending ([Fernandez-Corugedo & Muellbauer, 2006](#)).

The secondary banking crisis of 1974 was a shock to the UK financial markets, caused by the changing atmosphere of the British banking system. A couple of elements came together to trigger the crisis, including that the United Kingdom entered the European Economic Community. Additionally, the development of the Eurodollar markets attracted several local banks, and because previous regulation opened the market to foreign banks, there was an increase in the flow of capital into the country. Nonetheless, lack of regulation and supervision by the Bank of England was the proximate cause of this crisis ([Metcalf, 1982](#); [Scott, 1996](#)). If anything, this negative shock to the financial markets worked to reduce the demand for consumer credit and could help explain the u-shaped curve after the CCA74 seen in figure 2.1.

### **A.1.3 Main players and market makers**

The consumer credit industry in the United Kingdom prior to the CCA74 was divided into several groups ([Crowther et al., 1971](#); [Goode, 1979](#)). First there were the banks and finance houses, which acted as the main suppliers of consumer credit. Clearing banks entered the consumer credit market significantly after the 1960s. The main consumer credit products they offered were overdrafts, personal loans, and credit cards. Before 1974, there were mainly two types of credit cards, travel and entertainment cards such as Diner's Club and American Express and cards that allowed for installment payments, such as Access and Barclaycard. Banks also acquired finance houses and thus entered the market more broadly.

[Consoli \(2005a\)](#) stated that the progressive lowering of technological and institutional barriers that sheltered the cartel—created by depository institutions—from competition for decades induced it to revise its strategic plans. In the mid-1960s, banks and credit reference agencies computerized their customer databases and information processing systems, increasing the amount of available information about consumer credit behavior and improving the speed with which this information was analyzed and processed ([Finlay, 2009](#)). The creation of a network in the UK retail banking industry allowed banks to diversify their activities, expanding into new business lines such as credit cards, stock brokerage, investment management ser-

vices, and insurance ([Consoli, 2005b](#)). Finance houses extended credit primarily through hire purchases and credit sale agreements but also entered the market for personal loans and revolving credit. One of the most common ways that finance houses used to extend credit was through motor vehicle hire-purchases in which buyers did not have direct contact with the finance house and likely were not aware who was extending the credit.

The second group was formed by check, voucher, and credit traders, credit card issuers, pawnbrokers and moneylenders, and mutual aid societies. Check trading was developed during the end of the 19th century as a costly but convenient way to manage the household budget. Before the promulgation of the CCA74, check trading was increasing, especially in the north of England ([Goode, 1979](#)). Credit trading (Scotch drapers, tallymen or credit drapers) were doorstep sellers who sold mainly clothing and drapery and then collected the weekly payments ([O'Connell, 2009a](#)). This type of consumer credit was also extremely costly but seemed convenient for British households during the 19th and early 20th centuries.

Pawnbrokers and moneylenders represented a relatively insignificant source of consumer credit at the time of the Crowther Report ([Goode, 1979](#)). Mutual aid societies were forms of association in which, for the most part, individuals connected in some way and pooled resources to extend low-cost credit to their peers. Laws regulating these associations included the Friendly Societies Act 1974, Industrial and Provident Societies Acts 1965–1975 and, after the CCA74, the Credit Union Act 1979 ([Goode, 1979](#)). [Crowther et al. \(1971\)](#) argued in their report that more attention should be given to credit unions as a formal way of inexpensive financial inclusion for the working class.

The third group of principal players and market makers were retailers. These businesses sold goods on installments and therefore gave credit incidentally. Some partnered with a finance house and did not extend credit directly to their customers, but others did without being a formal financial institution. Retailers, mail order houses, and doorstep sellers were pivotal actors in the development of consumer credit markets, as their role complemented the increase of the use of consumer credit.

Finally, there were other significant institutions in the market, such as The Credit Reference Bureaux, debt collectors, credit insurers, and associations concerned with credit. The Finance Houses Association (nowadays, Finance & Leasing Association) protected the interests of finance houses, whereas the Consumer Credit Trade Association looked after the interests of retailers and some manufacturers. HP Information Ltd. was set up by the finance houses in 1938 to collect information related

to motor vehicles and associated goods hire-purchase agreements.

#### **A.1.4 Relevant regulation running up to the CCA74**

Several acts regulated a variety of products available on the consumer credit market before the enactment of the CCA74. At that time, consumer credit was regulated by the Bills of Sale Act 1854 (amended several times up to 1891), the Moneylenders Act 1900 (amended in 1911 and 1927), the Sale of Goods Act 1893, the Hire-Purchase Act 1938 (amended in 1954, 1964, and 1965), and the Advertisements (Hire-Purchase) Act 1967 ([Goode, 1979](#)).

Moreover, between 1966 and 1982, terms controls were in force from February 8, 1966, until July 20, 1971, when they were all abolished. They were introduced once again on December 18, 1973, and were in force until all were canceled again on July 27, 1982. Relaxation of these controls corresponds to the growth in consumer credit at a time when the demand for cars was also increasing ([Crowther et al., 1971](#)). At the time of the Crowther Report, the controls in force were the Hire-Purchase and Credit Sale Agreements (Control) Order 1969 and the Control of Hiring Order 1969. They were revoked in 1971 and restored in December 1973 ([Goode, 1979](#)). By the end of the 1970s, the controls in force were the Control of Hiring Order 1977 and the Hire-Purchase and Credit Sale Agreements (Control) Order 1976, amended in 1977 and 1978. The volumes of credit seem to be negatively correlated with these controls.

The 1970s and 1980s were a dynamic period for banking deregulation. The Competition and Credit Control Act 1971 promoted competition both within the banking sector and between banks and the non-bank financial sector ([Consoli, 2005a](#); [Davies et al., 2010](#); [Disney, Bridges, & Gathergood, 2008](#); [Offer, 2013](#)). Among the changes introduced by the Competition and Credit Control Act 1971 was allowing deposit banks to participate in the wholesale market ([Davies et al., 2010](#)). Liquidity requirements were also reduced, from 28% of deposits to 12.5% in liquid assets. Later, the Banking Acts 1979 and 1986 were passed ([Consoli, 2005a](#)). These acts introduced some barriers to entry while at the same time increased competition between British banks and foreign banks and non-bank financial institutions. The acts also abolished the strict division between the main areas of commercial banking and therefore the type of institutions that could operate in the market. The UK Building Society Act 1986 allowed these institutions to participate in a broader set of financial activities ([Finlay, 2009](#)).

## A.2 Additional descriptive statistics

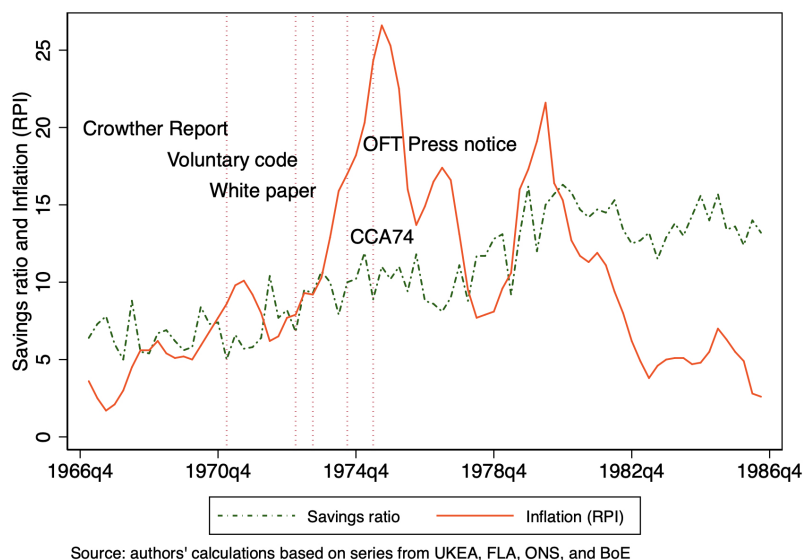
Table A.1 shows the information about the data implemented in the econometric strategy. The secondary sources used in this chapter include The Bank of England (BoE), the Finance & Leasing Association (FLA), the United Kingdom Quarterly Economic Accounts (UKEA), the Office for National Statistics (ONS), Nationwide, and Thomson Reuters.

**Table A.1:** Data and sources CCA74

Source	Variable proxied	Variable name	Units	SA	Price <sup>a</sup>
BoE	Consumer credit pre-1975	Sum of advances by British banks to retail distribution, hire-purchase finance houses, and personal (excluding for house purchase)	£m	NSA	CURR
BoE	Consumer credit post-1975	Consumer credit lending excluding securitizations to individuals	£m	NSA	CURR
FLA	Consumer credit price	Finance houses base rate	%	NSA	NA
UKEA	HH disposable income	HN: Real households' disposable income	£m	SA	CONS
UKEA	HH consumption	Household final consumption expenditure: National concept	£m	SA	CONS
UKEA	GDP	Gross domestic product: chained volume measures	£m	SA	CONS
ONS	Inflation	RPI 12 months change	%	NSA	NA
BoE	M4	Monetary financial institutions' sterling M4 liabilities to private sector	£m	SA	CURR
UKEA	Savings	Households and NPISH saving ratio	%	SA	NA
Nationwide	Household wealth	UK house prices index	Index	NSA	CURR 1925Q4=100
Thomson Reuters	Oil price	Crude Oil-Brent FOB	£/BBL	NSA	CURR
ONS LMS	Employment	Employment rate aged 16 and over	%	SA	CURR
UKEA	GDP deflator	GDP (expenditure) at market prices deflator	£m	SA	DEFL

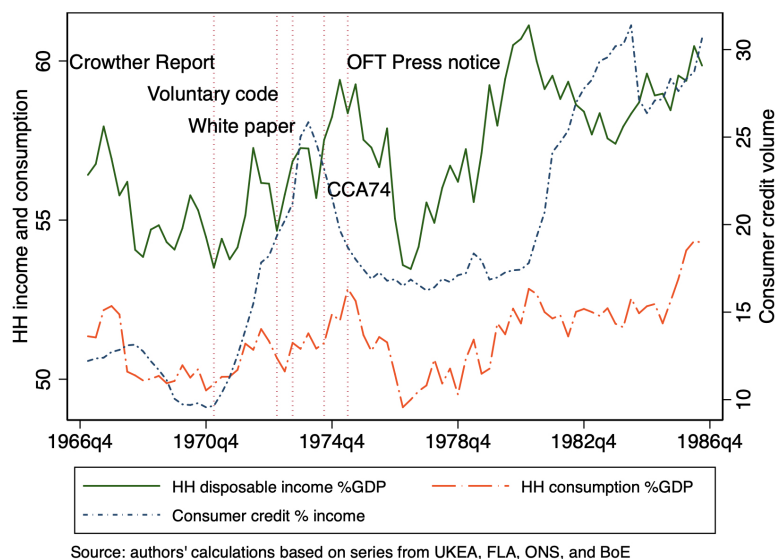
<sup>a</sup> CONS = constant prices. CURR = current prices. NA = not applicable. DEFL = deflator. The base year for the deflator and the constant prices is 2011 = 100.

**Figure A.1:** Savings and inflation (RPI) across enactment of CCA74



Note: dotted lines represent milestone events of the CCA74, namely the publication of the Crowther Report in March 1971, the issuing of the DTI's voluntary code in March 1973, the white paper in September 1973, the CCA74 in July 1974, and the OFT press notice campaign to explain the APR to credit issuers, shopkeepers, and the general audience in mid-1975.

**Figure A.2:** Income, consumption, and consumer credit across enactment of CCA74



Note: dotted lines represent milestone events of the CCA74, namely the publication of the Crowther Report in March 1971, the issuing of the DTI's voluntary code in March 1973, the white paper in September 1973, the CCA74 in July 1974, and the OFT press notice campaign to explain the APR to credit issuers, shopkeepers, and the general audience in mid-1975.

**Table A.2:** Unit-root tests of non-stationarity and KPSS of stationarity

Variable	ADF	Phillips-Perron		DF-GLS		KPSS	
	AIC Z(t)	Z(rho)	Z(t)	Opt Lag	Min SC	Min MAIC	Opt Lag
Consumer credit % income	-2.473	7.384	-1.900	-2.334	-1.919	-1.919	.141*
$\Delta$ Consumer credit % income	-3.866***	-46.934***	-5.539***	-3.403***	-3.787***	-3.298***	.095
Consumer credit % income (logs)	-2.949	-7.651	-1.961	-2.806*	-2.806*	-2.226	.106
$\Delta$ Consumer credit % income (logs)	-3.355***	-34.848***	-4.629***	-4.641***	-3.326***	-3.326***	.0741
Consumer credit % income (HP)	-3.134**	-12.157*	-2.484	-2.955***	-2.537**	-2.537**	.0682
Consumer credit % income (BW)	-3.368**	-15.057**	-2.762*	-3.924***	-2.868***	-2.868***	.0552
Spliced nominal rate (%)	-2.777	-12.126*	-2.592*	-1.787	-1.876*	-1.876*	.776***
$\Delta$ Spliced nominal rate	-7.820***	-67.622***	-7.803***	-7.459***	-4.946***	-4.946**	.0609
Spliced nominal rate (logs)	-3.256**	-12.570*	-2.652*	-1.634	-1.801	1.634	.808**
$\Delta$ Spliced nominal rate (logs)	-5.177***	-70.039***	-7.894***	-4.267***	-4.267***	-2.659***	.0548
Spliced nominal rate (HP)	-3.922***	-21.413***	-3.395**	-3.731***	-3.399***	-3.399***	.041
Spliced nominal rate (BW)	-4.173***	-23.804***	-3.610***	-3.720***	-3.602***	-3.602***	.0373
Spliced real rate (%)	-1.945	-8.707	-1.997	-1.635	-2.135*	-1.635	.332
$\Delta$ Spliced real rate	-6.022***	-52.178***	-6.274***	-5.477***	-5.477***	-4.640***	.125
Spliced real rate (HP)	-5.430***	-25.958***	-3.742***	-4.564***	-4.564***	-3.977***	.0327
Spliced real rate (BW)	-5.668***	-27.197***	-3.842***	-4.777***	-4.777***	-4.135***	.0288
Disposable income %GDP	-3.285*	-18.651*	-3.264*	-3.014*	-2.503	-2.503	.0705
$\Delta$ Disposable income %GDP	-10.086***	-85.417***	-10.163***	-9.945***	-6.135***	-6.135***	.0612
Disposable income (logs)	-3.292*	-18.696*	-3.271*	-3.013*	-2.526	-2.526	.0702
$\Delta$ Disposable income (logs)	-10.006***	-84.411***	-10.088***	-9.859***	-6.155***	-6.155***	.0609
Disposable income (HP)	-3.797***	-25.164***	-3.814***	-3.778***	-3.080***	-3.080***	.0503
Disposable income (BW)	-4.280***	-30.831***	-4.308***	-4.300***	-3.609***	-3.609***	.0448

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Continued on next page

**Table A.2: Unit-root tests of non-stationarity and KPSS of stationarity – continued from previous page**

Variable	ADF	Phillips-Perron		DF-GLS		KPSS	
	AIC Z(t)	Z(rho)	Z(t)	Opt Lag	Min SC	Min MAIC	Opt Lag
Savings (%)	-3.579**	-48.490***	-5.651***	-3.140**	-3.140**	-2.110	.13*
Savings (logs)	-2.174	-53.169***	-6.037***	-2.107	-3.305**	-2.107	.168**
$\Delta$ Savings (logs)	8.674***	-96.645***	-17.978***	-1.020	-5.899***	-1.020	.0782
Savings (HP)	-7.284***	-68.143***	-7.364***	-7.332***	-4.414***	-3.066**	.0471
Savings (BW)	-7.863***	-72.953***	-7.902***	-7.851***	-4.796***	-3.317***	.0408
Employment (%)	-2.573	-4.819	-1.542	-2.519	-2.519	-1.945	.299***
$\Delta$ Employment	-2.951**	-28.725***	-4.133***	-2.807***	-2.807***	-2.807***	.111
Employment (logs)	-2.551	-4.784	-1.538	-2.496	-2.496	-1.934	.3***
$\Delta$ Employment (logs)	-2.961**	-28.702***	-4.133***	-2.818***	-2.818***	-2.818***	.112
Employment (HP)	-4.140***	-10.965*	-2.310	-4.029***	-3.526***	-2.694***	.0637
Employment (BW)	-4.291***	-12.841*	-2.535	-4.211***	-3.669***	-2.857***	.0519
House price change	-3.996***	-27.836***	-4.042***	-3.921***	-2.461**	-2.186**	.0608
House price change (HP)	-4.438***	-36.150***	-4.724***	-4.379***	-2.854***	-2.459**	.0355
House price change (BW)	-4.520***	-42.323***	-5.200***	-4.455***	-3.093***	-2.587**	.0336
Inflation (%)	-1.919	-7.100	-1.856	-1.442	-1.872*	-1.442	.377*
$\Delta$ Inflation	-3.427**	-39.996***	-5.050***	-2.946***	-4.044***	-2.638***	.155
Inflation (HP)	-4.167***	-19.615***	-3.179**	-3.460***	-4.008***	-2.623***	.0393
Inflation (BW)	-4.175***	-21.106***	-3.304**	-3.521***	-4.225***	-2.706***	.0348
M4	3.771	1.944	4.199	-1.506	-1.506	-1.506	.498***
$\Delta$ M4	-3.043**	-11.941*	-2.626*	1.737	1.737	1.737	1.8***
M4 (logs)	-5.486***	-8.960	-2.492	-3.050**	-1.726	-1.726	.102
$\Delta$ M4 (logs)	-2.270	-44.492***	-5.446***	-2.570**	-3.934***	-2.225**	.17
M4 (HP)	-3.335**	-13.099*	-2.149	-2.612***	-2.191**	-2.191**	.0927
M4 (BW)	-4.082***	-20.453***	-3.025**	-3.591***	-3.169***	-2.455**	.0535

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

Continued on next page

**Table A.2: Unit-root tests of non-stationarity and KPSS of stationarity – continued from previous page**

Variable	ADF	Phillips-Perron		DF-GLS		KPSS	
	AIC Z(t)	Z(rho)	Z(t)	Opt Lag	Min SC	Min MAIC	Opt Lag
Consumption %GDP	-2.726	-14.515	-2.648	-2.483	-1.861	-1.861	.172**
$\Delta$ Consumption %GDP	-9.889***	-83.234***	-9.969***	-9.886***	-6.648***	-3.057***	.164
Consumption (logs)	-2.764	-14.695	-2.683	-2.510	-1.887	-1.887	.17**
$\Delta$ Consumption (logs)	-9.917***	-83.326***	-10.002***	-9.916***	-6.679***	-3.083***	.16
Consumption (HP)	-3.986***	-28.195***	-4.025***	-3.986***	-3.246***	-3.246***	.0503
Consumption (BW)	-4.521***	-34.399***	-4.566***	-4.520***	-3.674***	-3.674***	.043

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table reports the Augmented Dickey Fuller, Phillips-Perron, and Dickey Fuller GLS unit-root tests of non-stationarity and the KPSS test of stationarity for all series. These tests were calculated, when possible, for the series in levels, the first difference of the series in levels, the series in logarithms, the first difference of the logarithm of the series, and the filtered series, using [Hodrick and Prescott \(1997\)](#) and Butterworth rational square-wave filtering([Pollock, 2000](#)). The conclusion is that the best way to eliminate the unit roots in all the series, while preserving their interpretation as simply and straightforwardly as possible, is to filter the data.



## A.3 Robustness checks of main results

**Table A.3:** Effect of the Consumer Credit Act 1974 (APR) on consumer credit - Robustness checks

	(1) CC % income	(2) %Δ CC % income	(3) CC % income	(4) CC % income IV
CCA74	-0.0336 (0.520)	0.00528 (0.007)	-0.162 (0.492)	-0.121 (0.466)
Spliced nominal rate	0.399 (0.257)	0.0164 (0.058)	0.608* (0.320)	0.495* (0.285)
Spliced real rate	0.583*** (0.188)	0.0106* (0.006)	0.381 (0.247)	0.459** (0.225)
<b>Nominal interaction</b>	<b>-0.608**</b> (0.286)	<b>-0.0348***</b> (0.010)	<b>-0.789**</b> (0.323)	<b>-0.674**</b> (0.293)
Real interaction	-0.472** (0.198)	-0.00758 (0.007)	-0.298 (0.249)	-0.370 (0.228)
Income			0.626** (0.263)	0.592** (0.242)
Savings			-0.407* (0.227)	-0.397* (0.210)
D.Employment			0.00733** (0.003)	0.00713** (0.003)
House price Δ			-0.0227 (0.133)	-0.0409 (0.124)
Constant	-0.112 (0.438)		-0.0334 (0.405)	-0.0748 (0.385)
Observations	79	78	78	78
$R^2$	0.334	0.076	0.415	0.414
Adjusted $R^2$	0.289	0.013	0.338	0.337
Hansen J p-value				0.9046
F test p-value from first-stage regressions				0.000

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The table reports the results from the most pragmatic specification, i.e., without control variables, in column (1). Then, column (2) presents the results from using the first difference of the logarithm of the variables, i.e., the percentage change. In this specification, the real rate is expressed as the first difference of the variable in levels, because a logarithmic transformation is not possible here, due to the negative values that the real rate takes in several points. Following, column (3) depicts the results from estimating equation 2.1 without controlling for significant time periods and without including the dynamics of the independent variables. Finally, column (4) extends the results from the previous column, using 2SLS regressions.

**Table A.4:** Effect of the Consumer Credit Act 1974 (APR) on consumer credit - Butterworth filter

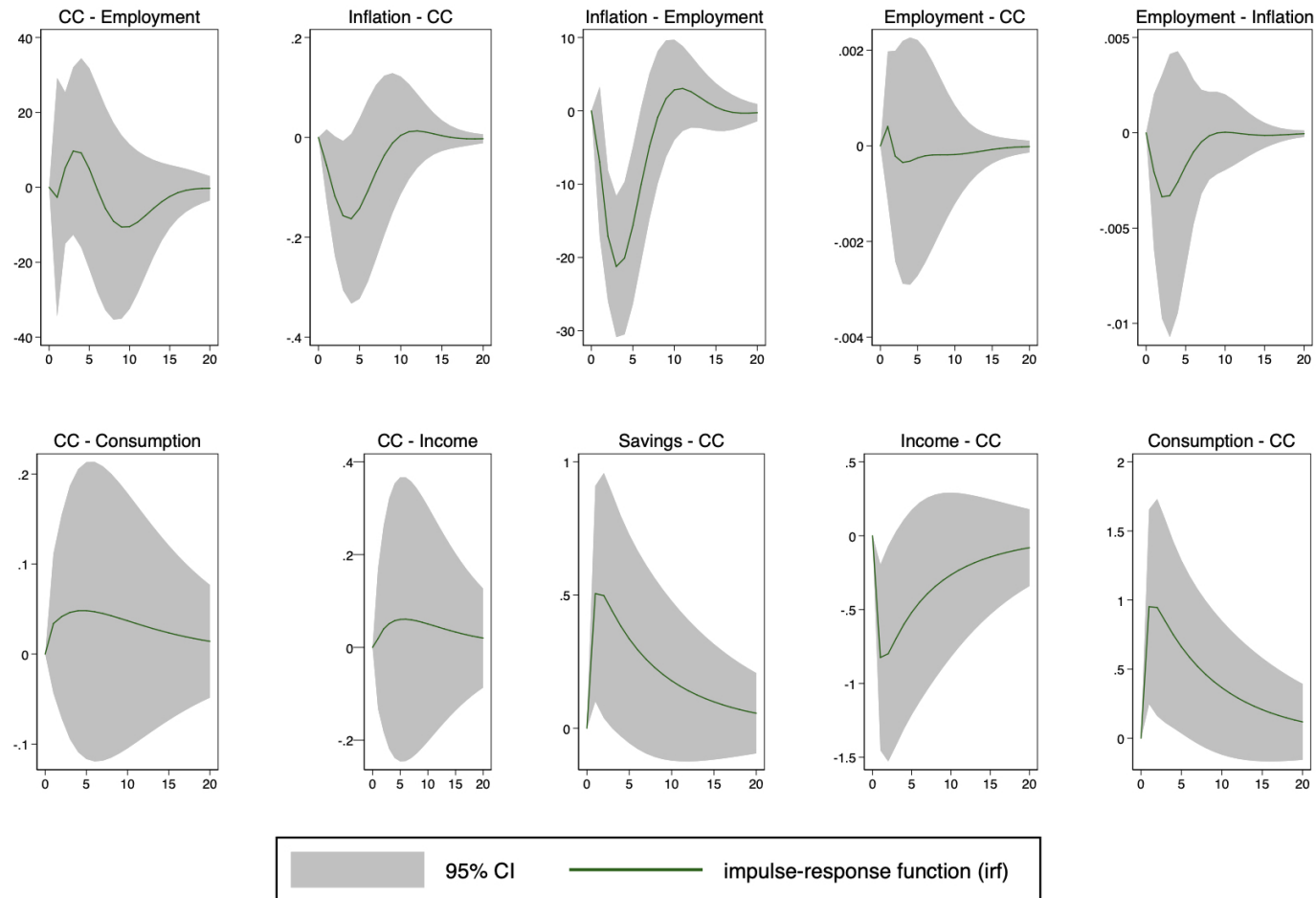
	(1)		(2)		(3)		(4)	
	CC % income		CC % income		Nominal rate		Nominal intera	
CCA74	0.499	(1.249)	0.365	(1.024)	-0.232*	(0.116)	-0.208*	(0.120)
Nominal rate	1.160***	(0.432)	1.073***	(0.349)				
Real rate	-0.0436	(0.341)	0.0190	(0.279)	1.004***	(0.030)	-0.126***	(0.032)
<b>Nominal intera</b>	<b>-1.369***</b>	<b>(0.414)</b>	<b>-1.271***</b>	<b>(0.338)</b>				
Real intera	0.193	(0.325)	0.136	(0.266)	0.132***	(0.031)	1.271***	(0.032)
Crowther	1.983**	(0.914)	1.913**	(0.755)	0.181**	(0.068)	-0.0112	(0.069)
Income	0.775*	(0.400)	0.745**	(0.327)	-0.101*	(0.052)	-0.102*	(0.052)
L.Income	-0.0839	(0.487)	-0.106	(0.397)	-0.0554	(0.060)	-0.0513	(0.061)
L2.Income	0.581	(0.493)	0.583	(0.402)	-0.0193	(0.056)	-0.0421	(0.054)
L3.Income	0.151	(0.483)	0.163	(0.395)	-0.0298	(0.047)	-0.0222	(0.050)
L4.Income	0.488	(0.337)	0.484*	(0.276)	0.0910***	(0.034)	0.0724*	(0.037)
Savings	-0.539**	(0.265)	-0.529**	(0.215)	0.0927***	(0.031)	0.0845***	(0.031)
L.Savings	-0.330	(0.263)	-0.320	(0.215)	0.0867**	(0.036)	0.0787**	(0.038)
L2.Savings	-0.619**	(0.242)	-0.622***	(0.197)	0.0127	(0.032)	0.0227	(0.030)
L3.Savings	-0.427	(0.277)	-0.428*	(0.228)	0.0289	(0.024)	0.0314	(0.026)
L4.Savings	-0.184	(0.235)	-0.187	(0.191)	-0.0434*	(0.025)	-0.0338	(0.025)
Corset	-0.0318	(0.908)	0.0799	(0.747)	0.263***	(0.086)	0.215**	(0.091)
Thatcher	0.588	(1.049)	0.702	(0.857)	0.302***	(0.112)	0.264**	(0.117)
D.Employment	0.00601*	(0.003)	0.00595**	(0.003)	-0.000175	(0.000)	-0.000343	(0.000)
House price $\Delta$	-0.157	(0.106)	-0.158*	(0.086)	-0.0442***	(0.009)	-0.0392***	(0.010)
L.House price $\Delta$	-0.00401	(0.104)	-0.00675	(0.084)	-0.0224**	(0.010)	-0.0211**	(0.009)
L2.House price $\Delta$	0.0410	(0.124)	0.0305	(0.101)	-0.00831	(0.015)	-0.00500	(0.014)
L3.House price $\Delta$	0.213	(0.133)	0.202*	(0.108)	0.0158	(0.009)	0.00909	(0.010)
L4.House price $\Delta$	0.00773	(0.118)	0.00544	(0.096)	0.0153**	(0.007)	0.0132*	(0.007)
Inflation					0.855***	(0.051)	-0.185***	(0.057)
D.M4					-0.000127	(0.000)	-0.000183**	(0.000)
Inflation intera					0.0735	(0.048)	1.123***	(0.054)
D.M4 intera					0.000137	(0.000)	0.000187*	(0.000)
Constant	-0.937*	(0.488)	-0.932**	(0.409)	-0.0900*	(0.046)	-0.0694	(0.051)
Observations	74		74		74		74	
$R^2$	0.651		0.651		0.997		0.996	
Adjusted $R^2$	0.481		0.480		0.995		0.993	
Hansen J p-value			0.1749					
F test p-value					0.000		0.000	

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Column (1) presents the results of the regression of consumer credit as a percentage of households' disposable income, via OLS, on a dummy variable (CCA74) that is equal to 1 after the enactment of the law and its interaction with the spliced nominal and real interest rates. Additional control variables include the period from the publication of the Crowther Report in March 1971 to the enactment of the CCA74, households' disposable income (and its first four lags), households' savings ratio (and its first four lags), the period of the Corset restrictions, the Thatcher government period, the first difference (change quarter on quarter) of the employment levels, and the house price index quarter-on-quarter change (and its first four lags). Column (2) reports the output of the regression using instrumental variables (inflation, the first difference of M4, and their respective interaction with the dummy variable). Columns (3) and (4) depict the results of the first-stage regressions for the endogenous variables (i.e., the nominal and real interest rates) on the instruments and all the other exogenous variables.

**Figure A.3:** Additional impulse - response functions from VAR models CCA74



Source: Authors' calculations from VAR models

Note: the figure presents the evolution of the response variable (second name in each plot) over a period of 5 years, after the introduction of a temporary shock in the impulse variable (first name in each plot). Shocks are significant whenever zero is not inside the 95% confidence interval.

# Appendix B

## Detailed statistical support for consumption inequality, well-being, and consumer credit

### B.1 Detailed descriptive statistics

Tables [B.1](#) to [B.4](#) present the use of consumer credit by product and income deciles for the 4 waves (1995, 2000, 2005, 2012-13). As seen from these tables (row “Total”), the percentage of people owing money in any given consumer credit product (column (1) of each table) fell in the last 20 years; going from 45% in 1995, to 43% in 2000, 36% in 2005, and 31% in 2012–2013. This can suggest that consumer credit was concentrating around fewer individuals who were demanding greater credits, as fewer respondents reported using consumer credit as time passed in the sample, and fewer people reported having joint consumer credit commitments (15% of respondents in 1995, falling to 7% by the end of the period). Nonetheless, it is important to note that because of the panel structure of the data, throughout almost 20 years, these statistics were also driven by the change in the stage of the life cycle these individuals were in during each wave.<sup>1</sup>

Looking at disaggregated consumer credit separately, one observes a similar pattern, except for credit cards. Hire-purchase agreements (column (2) of each table) went from 14% in 1995, to 10% in 2000, then to 7% in 2005, and to 6% in 2012–2013. Use of personal loans (column (3) of each table) went from 18% in 1995, to 17% in 2000, 16% in 2005, and finally 11% by the end of the period. For mail order purchases in column (5), the percentage went from 13% in 1995, to 11% in 2000, 6%

---

<sup>1</sup>The average age of the respondents went from 41 to 57 years of age across the sample. The econometric exercises took this into account.

in 2005, and 4% in 2012–2013. Loans from other individuals, reported in column (6), started at around 2% in 1995 and then dropped to around 1% for the rest of the sample period.

The only product that experienced an increase was store and credit cards. There might be some substitutability between hire purchase and mail order and store and credit cards. For the latter (column (4) of each table), the percentage of respondents with positive balances in these debts went from 18% in 1995, increasing to 21% in 2000, and then stabilizing at 15% for the rest of the period of analysis. Having store or credit cards (not necessarily owing money on these products) followed the same pattern. In 1995, 59% of the respondents owned a store or credit card; this rose to 70% in 2000 and then decreased to 69% after 2005. For DSS social fund loans, the percentage remained extremely low, at around 1% for the entire period. Finally, there was no information for overdrafts or student loans in 1995, but they seemed to follow similar trends. Overdrafts remained rather stable from 2000 to 2012–2013 at around 7%, whereas student loans remained low and decreased from 3% to 1% in the sample.<sup>2</sup>

An additional important dimension of tables B.1 to B.4 is how access to consumer credit varied across the income distribution. In table B.1, one observes that 38% of households in the first two deciles owed money for any given product, as column (1) reports. This percentage then increased up to a maximum of 54% for the sixth decile, with the exception of percentiles 40–50 for which it was 40%, and then slightly dropped to 43% for the top decile. This already suggests that there were asymmetries in the access to consumer credit, thus further motivating the discussion about which households benefitted more from having access to consumer credit. It is important to note that this pattern was seen in all waves, as reported in tables B.2, B.3, and B.4, even though there was a considerable overall reduction in the percentage of respondents participating in these markets.

Columns (2) to (6) of tables B.1 to B.4 highlight some additional information about the asymmetries of access to consumer credit across the income distribution. If there was a difference in how poorer households accessed different products compared with wealthier households, as argued in the literature, there was a great probability that poorer households did not enjoy the benefits of cheap and fair consumer credit. Column (2) of table B.1 shows that hire-purchase agreements began at around 7% for the first two income deciles, then jumped to more than 10% to a maximum of

---

<sup>2</sup>Taking into account the average age of the respondents in the sample, the proportion of students was possibly rather low. It went from 5% in 1995 to almost 0% by 2012–2013. Moreover, the chapter did not include overdrafts or student loans in the analysis, because there was no information about these in the first wave.

18% for the 4th, 6th, and 7th decile, and decreased again to around 15% for the richest households. Although in tables [B.2](#) to [B.4](#), one observes a general decrease in these agreements, the reduction was more marked for households above the third decile of the income distribution.

Column (3) presents the use of personal loans across the income distribution. Not surprisingly, tables [B.1](#), [B.2](#), [B.3](#), and [B.4](#) show that the percentage of respondents owing money in these loans was considerably lower for poorer households. As with hire-purchase agreements, there seemed to be an inverse u-shaped relationship between the income distribution and the use of these products, starting at a low level of participation for the first income deciles, increasing to a maximum around the 7th and 8th deciles, and then declining for the richest households, but not as much as for the first income deciles.

A different trend was observed for credit cards. There was a quasilinear positive trend both in the access to credit cards and their use. For the four waves, holding a credit or store card went from around 40% for the first income deciles and up to more than 70% for the richest households. This pattern was similar for credit cards in the four waves. Column (4) of tables [B.1](#) to [B.4](#) shows that the use of credit cards went from less than 10% for the first decile and kept increasing across the income distribution, to 20% or more for the right tail of the distribution.

The opposite trend can be seen in column (5) of tables [B.1](#) and [B.2](#) for mail order purchases. For these two waves, use of mail order was considerably higher for the lower income deciles, ranging from around 20% for the first decile and down to around 4% for the highest decile in table [B.1](#). The same pattern was observed in table [B.2](#). This further contributes to the existing empirical evidence that suggests that poorer households make systematically different use of consumer credit, most likely due to restrictions in the access to these markets. Tables [B.3](#) and [B.4](#) show a significant decrease in the use of mail order purchases, particularly for poorer households, thus making this type of credit less popular overall. Poorer households might have substituted this kind of credit for other high-cost credit products or might have just reduced their use of consumer credit overall. Finally, credit from other individuals seemed to be uniformly distributed across the entire sample units and periods. This type of credit remained rather low, at less than 2%.

**Table B.1:** Percentage of consumer credit by product and income deciles 1995

	(1)	(2)	(3)	(4)	(5)	(6)
	Owes	Hire purchase	Personal loan	Credit card	Mail order	From ind.
less p.10	.376947	.0654206	.1214953	.0903427	.1931464	.0186916
p.10-20	.3793103	.0721003	.0971787	.1222571	.1912226	.0188088
p.20-30	.421875	.134375	.13125	.125	.15625	.009375
p.30-40	.48125	.178125	.165625	.184375	.159375	.0125
p.40-50	.3981191	.1034483	.1880878	.153605	.1003135	.0188088
p.50-60	.540625	.1875	.23125	.196875	.125	.021875
p.60-70	.5266458	.1761006	.2138365	.2421384	.1383648	.0251572
p.70-80	.5125	.140625	.225	.234375	.1125	.028125
p.80-90	.4517134	.1464174	.1993769	.1838006	.0872274	.0155763
p.90+	.4339623	.1572327	.1918239	.2264151	.0377358	.0251572
Total	.452299	.1361076	.1764706	.1758448	.1301627	.0193992
Obs.	3197	3196	3196	3196	3196	3196

This table presents the percentage usage of consumer credit in the sample by product (columns (1) to (6)) and by income decile (rows “less p.10” to “p.90+”), and total. Column (1) refers to the use of any kind of consumer credit product, whereas columns (2) to (6) report the data for each type of product separately.

**Table B.2:** Percentage of consumer credit by product and income deciles 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Owes	Hire purchase	Personal loan	Credit card	Mail order	From ind.
less p.10	.2928349	.0685358	.0654206	.0841121	.1370717	.0124611
p.10-20	.315625	.065625	.08125	.134375	.13125	.0125
p.20-30	.353125	.075	.109375	.153125	.11875	.015625
p.30-40	.4545455	.1065831	.184953	.2288401	.1347962	.0062696
p.40-50	.484375	.115625	.19375	.234375	.13125	.015625
p.50-60	.4796238	.1097179	.2100313	.2194357	.1097179	.0219436
p.60-70	.4984326	.1572327	.2044025	.2641509	.1100629	.0062893
p.70-80	.490625	.134375	.228125	.2375	.0875	.025
p.80-90	.515625	.11875	.225	.275	.05625	.0125
p.90+	.4639498	.0909091	.200627	.2570533	.0658307	.0062696
Total	.4347826	.1041927	.1702128	.2086984	.1082603	.0134543
Obs.	3197	3196	3196	3196	3196	3196

This table presents the percentage usage of consumer credit in the sample by product (columns (1) to (6)) and by income decile (rows “less p.10” to “p.90+”), and total. Column (1) refers to the use of any kind of consumer credit product, whereas columns (2) to (6) report the data for each type of product separately.

**Table B.3:** Percentage of consumer credit by product and income deciles 2005

	(1)	(2)	(3)	(4)	(5)	(6)
	Owes	Hire purchase	Personal loan	Credit card	Mail order	From ind.
less p.10	.20625	.03125	.071875	.06875	.046875	.0125
p.10-20	.2024922	.0404984	.0747664	.0654206	.0654206	.0093458
p.20-30	.325	.090625	.1375	.11875	.078125	.015625
p.30-40	.3805031	.0566038	.1509434	.1792453	.0660377	.0062893
p.40-50	.390625	.09375	.165625	.15625	.075	.00625
p.50-60	.428125	.1	.203125	.16875	.065625	.009375
p.60-70	.4106583	.0689655	.1661442	.1786834	.0689655	.0094044
p.70-80	.446875	.096875	.23125	.19375	.05	.015625
p.80-90	.3894081	.0841121	.1806854	.1557632	.0404984	.0031153
p.90+	.427673	.0754717	.2044025	.2201258	.0408805	.0125786
Total	.3606506	.0738192	.1585862	.1504536	.0597435	.0100094
Obs.	3197	3197	3197	3197	3197	3197

This table presents the percentage usage of consumer credit in the sample by product (columns (1) to (6)) and by income decile (rows “less p.10” to “p.90+”), and total. Column (1) refers to the use of any kind of consumer credit product, whereas columns (2) to (6) report the data for each type of product separately.

**Table B.4:** Percentage of consumer credit by product and income deciles 2012-13

	(1)	(2)	(3)	(4)	(5)	(6)
	Owes	Hire purchase	Personal loan	Credit card	Mail order	From ind.
less p.10	.1567398	.015674	.0250784	.0877743	.0219436	0
p.10-20	.1540881	.0188679	.0377358	.0754717	.0377358	.0062893
p.20-30	.2201258	.0471698	.0566038	.091195	.0566038	.0062893
p.30-40	.2570533	.0470219	.0815047	.0940439	.0532915	.0094044
p.40-50	.3040752	.0564263	.1034483	.1598746	.0501567	.0125392
p.50-60	.3312303	.0315457	.1514196	.1798107	.0252366	.0094637
p.60-70	.38125	.071875	.121875	.21875	.03125	.00625
p.70-80	.4164038	.0630915	.1766562	.2239748	.0536278	.022082
p.80-90	.44375	.1125	.178125	.1875	.046875	.009375
p.90+	.4050633	.1139241	.1582278	.1993671	.0063291	.0094937
Total	.3069431	.0578071	.1090167	.1517436	.0383286	.0091109
Obs.	3183	3183	3183	3183	3183	3183

This table presents the percentage usage of consumer credit in the sample by product (columns (1) to (6)) and by income decile (rows “less p.10” to “p.90+”), and total. Column (1) refers to the use of any kind of consumer credit product, whereas columns (2) to (6) report the data for each type of product separately.

The next set of tables presents the descriptive statistics for households’ expenditures as a percentage of their income, the subjective well-being measures, and the levels of consumer credit as a percentage of household income by income deciles.



Tables B.5 to B.8 contain the mean and median of monthly and yearly expenditures as percentage of household incomes (columns (1) to (5)), the Likert and Caseness measurements (columns (6) and (7)), and the consumer credit debt-to-income ratio reported in column (8).

Column (1) of these tables reports that the monthly household expenditure for groceries remained rather stable across time. The difference between the mean and the median, particularly for the first income decile, suggests the presence of some households for which this ratio was considerably high, thus pulling up the mean values. The literature of Engel curves argues that the income elasticity of consumption of necessity goods indicates that as households' income increases, the share of these expenditures decreases. The share of this expenditure item has also remained stable even though the price level for these types of goods increased across the sample time period, as seen in figure 3.2.

Next, monthly energy was reported in column (2) of tables B.5 to B.8. This expenditure item followed a pattern similar to that of monthly groceries. As households became richer, the share of this expenditure decreased. Moreover, it is important to note that over time this expenditure decreased overall. This may be because older households might consume less energy, as the price of household services increased in a similar way to that of "total food," as figure 3.2 depicts. For monthly housing expenditure, reported in column (3), there was information for the first three waves. The expenditure share of this item remained stable, even though this item depicted the steepest increase in prices (figure 3.2). Nonetheless, across waves, the difference between the mean and the median became larger even up to the 4th decile in 2005. This suggests that a higher proportion of households might have received subsidies or benefits to cover their housing costs.

Column (4) of tables B.6 to B.8 presents the monthly expenditure on leisure. The share of this expenditure remained quite stable for the three waves for which there was information, as with housing, even though the increase in the price level of these kind of goods was the second steepest of all (figure 3.2). As with other items in this sample, it is clear that poorer households allocated a larger share of their income to this expenditure than did wealthier households. The mean expenditure on this item was around 4% (2% for the median) for households in the first income decile, and around 1% (both mean and median) in 2000, increasing to 1,5% in 2012–2013 for the top income decile.

The next column of tables B.5 to B.7 report the yearly household expenditure on consumer durables as a percentage of household income. What is most striking here is that in 1995, at least 50% of the respondents did not make consumer durables

purchases (as seen in the value of the median across the income distribution). This pattern changed in 2000 and 2005, except for the lower income deciles. Again, there was a negative trend in the expenditure on consumer durables across the income distribution, which held for the waves for which there was information, going from around 20% in the lowest income decile to less than 10% in the top decile. This is somewhat unexpected, as richer households could be spending on more luxurious and expensive cars, laptops, home appliances, and so on, although this did not seem to be the case. Nonetheless, the big difference between the mean and median for all groups contributes to the evidence that there was an important portion of households that might even be overspending on these types of goods.

The next columns ((6) and (7)) of tables [B.5](#) to [B.8](#) show the median and mean of the self-reported well-being variables across the income distribution. Looking at the statistics throughout the four waves, one finds that the values seemed to be stable. Likert began at an average of 11.19 in 1995, increased to 11.39 in 2000, but then decreased to 11.31 in 2005 and to 10.98 in 2012–2013. Finally, Caseness followed a similar trend to that of Likert, beginning at an average of 1.91 in 1995, then increasing to 1.95 in 2000, and then decreasing to 1.85 and 1.70 in 2005 and 2012–2013, respectively. Again, there was a negative trend across the income distribution, suggesting that poorer households seemed to be more distressed in general than were wealthier households.

The final column of tables [B.5](#) to [B.8](#) reports the level of consumer credit as a percentage of households' yearly income. One can extrapolate some regularities across the four waves. First, the pattern of the debt-to-income ratios seemed to be similar across the four waves. It began at a high level for the first income decile, then dropped for the second decile, increased up to the fifth or sixth decile, and then decreased for the top deciles. Additionally, except for the first wave, more than half of the respondents did not make use of consumer credit, as seen from the median value of each group. Moreover, and following the pattern of figure [3.1](#) and in line with previous research, the overall debt-to-income ratio had a positive trend for the first three waves but then fell after the financial crisis.

This appendix ends by mentioning some additional relevant characteristics of the data set. The percentage of respondents who saved from their income was almost constant for the entire period at 46%, although the average monthly amount saved from current income grew from around £55 in 1995, to £70 in 2000, £90 in 2005, and up to £110 in 2012–2013. The percentage of people with a savings account was constant in the period for which there were data, at around 73% of the respondents, from 2000 to 2012–2013. Nonetheless, the amount of savings increased throughout

the entire sample, somewhat at odds with what was seen in figure 3.1. The mean amount in savings accounts went from £4,580 in 1995, to £5,550 in 2000, £8160 in 2005, and up to £11,460 in 2012–2013. Interesting to note is that investments were rather constant in the first three waves, averaging more or less £5,800, but then more than tripled to around £17,960 in 2012–2013. The percentage of respondents having investments followed a similar trend—somewhat constant at close to 47% for the first three waves, and then it increased to 55% of the sample in 2012–2013 (with fewer people having joint investments as time passed). Individual and households' monthly incomes also followed a positive trend. They began at a mean of around £1,000 and £2,190 in 1995, respectively, increased to £1,270 and £2,590 in 2000, then to £1,550 and £3,040 in 2005, and to £1,860 and £3600 by the end of our period of analysis.

Finally, the percentage of individuals who had to incur in borrowing to meet household payments or were 2+ months late with their bills was rather low across the three waves for which there was information, staying at 1% for the period from 1995 to 2005. Nonetheless, the percentage of people who needed to cut expenses to meet payments began at 7% in 1995, although it decreased to 4% in 2000 and to 3% in 2005. A variable that followed a similar pattern and for which there was information for the four waves, was whether the respondent had problems paying for housing. The percentage of respondents having problems paying for housing was 8% in 1995, decreasing to 6% in 2000 and to 3% in 2005, but increasing slightly to 4% in 2012–2013. The final variable in the housing category was mortgage repayment starting at an average of £159 in 1995, increasing to £190 in 2000 and to £236 in 2005, and decreasing to £198 in 2012–2013.

**Table B.5:** HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groceries	Energy	Housing	Leisure	Durables	Likert	Caseness	CC / inc.
less p.10	35.25326	10.34291	16.81678	.	21.54412	12.09524	2.311111	6.907594
	32.46242	9.700644	1.378901	.	0	11	1	0
p.10-20	21.34565	5.625503	12.81657	.	18.64456	11.50476	1.961905	3.518833
	19.8314	5.173687	9.396379	.	0	10	0	0
p.20-30	18.55974	4.315609	11.07919	.	14.87706	11.33758	1.910828	3.924455
	16.72163	3.82139	10.53194	.	0	10	0	0
p.30-40	14.99994	3.421832	10.71299	.	15.10392	11.26814	1.92429	5.382561
	14.27475	3.334371	9.459816	.	0	10	0	0
p.40-50	14.10766	2.991886	10.24999	.	13.21099	11.40952	2.066667	3.652591
	12.69327	2.777341	9.849968	.	0	10	1	0
p.50-60	12.47443	2.751185	9.388019	.	12.88009	11.37931	1.909091	4.353435
	11.51801	2.634041	8.742542	.	1.449821	11	0	.2417122
p.60-70	11.0154	2.331965	8.401719	.	10.21415	10.57778	1.612698	3.879645
	9.876368	2.271828	7.843682	.	0	10	0	.0990523
p.70-80	10.25257	2.231417	7.986538	.	8.751336	10.63636	1.702194	3.517989
	10.46786	1.869586	7.58968	.	0	10	0	.0466497
p.80-90	9.613946	1.788587	7.623087	.	6.559885	10.91824	1.940252	2.978814
	9.205165	1.758884	7.165694	.	0	10	0	0
p.90+	6.862403	1.399502	7.460056	.	8.340224	10.75079	1.744479	2.599895
	6.689484	1.270776	6.705131	.	0	10	1	0
Total	15.46092	3.662978	10.23605	.	13.00095	11.18679	1.908028	4.07462
	12.35385	2.659513	8.144751	.	0	10	0	0
Obs.	3189	2919	3181	.	3117	3164	3164	3176

This table presents the descriptive statistics for households' expenditures as a percentage of their income, the subjective well-being measures, and the levels of consumer credit as a percentage of household income by income deciles. The table contains the mean and median of monthly and yearly expenditures as percentage of household incomes (columns (1) to (5)), the Likert and Caseness measurements (columns (6) and (7)), and the consumer credit debt-to-income ratio reported in column (8).

**Table B.6:** HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groceries	Energy	Housing	Leisure	Durables	Likert	Caseness	CC / inc.
less p.10	36.29758	7.504792	18.49733	4.605166	24.1149	12.1891	2.330128	8.479785
	31.36727	6.590629	1.644737	2.296795	0	11	1	0
p.10-20	21.03012	3.761819	9.88703	2.429127	15.84397	11.99365	2.184127	4.943184
	19.4288	3.635493	0	1.677253	0	11	1	0
p.20-30	16.35095	3.059454	8.90503	2.24221	14.19001	11.70032	2.053628	4.962202
	15.77677	2.823046	5.062071	1.620352	2.510987	11	0	0
p.30-40	15.09157	2.429787	10.16624	2.020409	13.62803	11.50314	1.921384	6.218197
	14.50893	2.42319	10.16327	1.5	2.279446	11	0	0
p.40-50	12.64148	2.176508	9.334887	1.872034	12.05539	11.34591	1.886792	6.272856
	12.11784	1.981049	9.622484	1.251711	1.235664	10	0	0
p.50-60	11.86869	1.924301	8.890275	1.736212	13.433	11.01911	1.869427	4.963914
	11.56289	1.77394	8.401993	1.335054	3.077003	10	0	0
p.60-70	10.2198	1.555936	9.972919	1.584123	12.75259	11.31329	2.044304	5.58611
	10.02413	1.499816	9.066615	1.255253	3.020751	10	0	0
p.70-80	9.827443	1.466377	7.810629	1.435003	10.77826	11.09494	1.734177	5.602779
	9.221718	1.426586	7.353249	1.068994	5.177342	10	0	0
p.80-90	8.677947	1.270497	8.146262	1.351998	9.754663	11.08176	1.830189	4.713576
	8.44332	1.295108	8.298203	1.015484	2.516531	10	0	.096548
p.90+	6.499725	1.009552	7.748438	1.100797	6.828062	10.67302	1.650794	4.068602
	6.310915	.8729815	6.15907	.8906832	1.908004	10	0	0
Total	14.84347	2.618078	9.924797	2.034098	13.31779	11.39063	1.949984	5.57806
	11.69248	1.856041	7.864703	1.26937	2.130388	10	0	0
Obs.	3178	3016	3184	3186	3173	3159	3159	3158

This table presents the descriptive statistics for households' expenditures as a percentage of their income, the subjective well-being measures, and the levels of consumer credit as a percentage of household income by income deciles. The table contains the mean and median of monthly and yearly expenditures as percentage of household incomes (columns (1) to (5)), the Likert and Caseness measurements (columns (6) and (7)), and the consumer credit debt-to-income ratio reported in column (8).

**Table B.7:** HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2005

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groceries	Energy	Housing	Leisure	Durables	Likert	Caseness	CC / inc.
less p.10	33.7855	7.315648	15.15847	4.440894	21.08165	12.07443	2.2589	7.468032
	27.51217	6.05672	0	2.202716	0	11	1	0
p.10-20	22.67461	4.421611	8.663219	2.721026	11.4395	11.44127	1.853968	4.240836
	20.60079	4.110136	0	2.135051	0	11	0	0
p.20-30	16.85188	3.023657	10.09207	2.254805	15.18294	11.55272	1.942492	6.722554
	14.6659	2.899598	2.930318	1.603991	0	11	0	0
p.30-40	14.73241	2.595244	8.395169	2.03179	10.78381	11.69524	1.984127	8.052161
	13.94879	2.327357	4.252731	1.357988	1.298436	11	0	0
p.40-50	13.0349	2.213316	8.585531	1.774473	11.6048	11.28931	1.946541	5.76114
	12.49074	2.038709	5.838901	1.363526	1.974668	10	0	0
p.50-60	11.55998	1.835317	10.95244	1.720446	7.573106	10.9619	1.673016	6.945544
	10.75427	1.837111	9.742425	1.272986	.5599822	10	0	0
p.60-70	10.23373	1.757884	9.855432	1.606265	7.922074	10.80696	1.518987	4.437014
	9.400453	1.571774	9.717952	1.250748	2.08522	10	0	0
p.70-80	8.905988	1.343863	9.51598	1.392172	7.035007	11.0981	1.781646	6.54801
	8.825521	1.324947	9.177382	1.075098	1.339672	10	0	0
p.80-90	8.23074	1.264293	7.992381	1.292792	8.385846	11.02194	1.673981	4.37792
	8.162192	1.204671	6.426317	.9992307	2.065705	10	0	0
p.90+	5.884768	.8979851	8.178252	1.138953	6.720278	11.17405	1.889241	4.047922
	5.402745	.788458	7.859155	1.012953	2.1365	10	0	0
Total	14.5847	2.681487	9.734427	2.036818	10.76506	11.30933	1.851206	5.860564
	11.57723	1.926034	6.689887	1.291033	1.111954	11	0	0
Obs.	3195	2695	3178	3191	3176	3152	3152	3164

This table presents the descriptive statistics for households' expenditures as a percentage of their income, the subjective well-being measures, and the levels of consumer credit as a percentage of household income by income deciles. The table contains the mean and median of monthly and yearly expenditures as percentage of household incomes (columns (1) to (5)), the Likert and Caseness measurements (columns (6) and (7)), and the consumer credit debt-to-income ratio reported in column (8).

**Table B.8:** HH XP, well-being, and consumer credit as percentage of HH income, by income deciles 2012-13

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groceries	Energy	Housing	Leisure	Durables	Likert	Caseness	CC / inc.
less p.10	32.27752	5.311835	.	4.008658	.	11.65493	2.066901	3.843742
	28.13285	4.501336	.	2.218318	.	10	0	0
p.10-20	21.1402	3.324598	.	3.394527	.	11.65068	1.989726	3.493325
	19.2802	2.886378	.	2.022876	.	11	0	0
p.20-30	18.2563	3.11084	.	3.320323	.	10.77961	1.532895	2.9338
	16.39567	2.967113	.	1.941115	.	10	0	0
p.30-40	16.50537	2.578287	.	3.203614	.	11.74161	2.040268	3.712269
	14.47787	2.484324	.	2.447871	.	10	0	0
p.40-50	14.13351	2.040815	.	2.992043	.	10.91118	1.782895	5.340754
	12.45404	1.917759	.	2.078947	.	9	0	0
p.50-60	12.0783	1.613263	.	2.862679	.	11.01645	1.5625	5.856937
	10.19713	.9233026	.	2.100418	.	10	0	0
p.60-70	10.32709	1.634577	.	2.559308	.	10.72607	1.646865	4.610457
	8.645439	1.449179	.	2.072802	.	10	0	0
p.70-80	9.007137	1.056466	.	2.185885	.	10.1204	1.29097	4.152607
	9.01177	0	.	1.820738	.	10	0	0
p.80-90	8.126772	1.094262	.	2.132937	.	10.54	1.516667	4.996131
	7.904755	.1775461	.	1.767913	.	10	0	0
p.90+	5.884814	.6887033	.	1.648485	.	10.77097	1.587097	3.813883
	5.609601	.15	.	1.488854	.	10	0	0
Total	14.7588	2.24444	.	2.830229	.	10.98432	1.698132	4.27554
	11.95701	1.142419	.	1.909263	.	10	0	0
Obs.	3179	3071	.	3179	.	2998	2998	3117

This table presents the descriptive statistics for households' expenditures as a percentage of their income, the subjective well-being measures, and the levels of consumer credit as a percentage of household income by income deciles. The table contains the mean and median of monthly and yearly expenditures as percentage of household incomes (columns (1) to (5)), the Likert and Caseness measurements (columns (6) and (7)), and the consumer credit debt-to-income ratio reported in column (8).

# Appendix C

## Detailed statistical support for household financial resilience and consumer credit

### C.1 Additional descriptive statistics

Tables [C.1](#) to [C.3](#) report the arithmetic mean and median values of households' total wealth, disaggregated into its 4 components, including physical, property, pension, and net financial wealth; households' financial assets to short-term liabilities ratio, used in the calculation of the proposed measure of financial resilience; households' well-being proxied with respondents' information about health, life satisfaction, and anxiety; and households' size, across the income deciles for the three waves in the data set. The relevance of looking at the values of the mean and the median of each of these variables is to highlight any non-normalities in the distributions of the variables that might suggest a higher concentration of the observations toward the tail of the distributions, rather than across the 50th percentile, which would suggest asymmetries that can reflect wealth inequalities and important well-being differences across the income distribution.

When studying these tables, the first item that strikes one is that by any definition or measurement of wealth (first 4 columns of the 3 tables, expressed in current sterling pounds), households at the lowest decile have become poorer throughout the 6 years in the data set. Overall, their physical wealth remained stagnant for both the average and median households whereas their property, pension, and net financial wealth decreased as time went on. This pattern appeared to occur only for the poorest households whereas for the rest of the groups, wealth tended to increase intra-group in each wave (except for property wealth for the average household of



the sixth decile between waves 3 and 4, and for net financial wealth of the median household of the seventh and eight deciles between 2014–2016).

Variation across the income deciles occurred as expected. Moving upward, the income distribution showed that wealth increased in all of its components linearly and with the same characteristic; mean values were always higher than were median values. This suggests the presence of few households in each decile with high values of wealth that pulled the distribution to the right, depicting changes and magnitudes that are considerably higher than those for the median household.

Column 1 of tables [C.1](#) to [C.3](#) shows that the mean value of physical wealth, went from around £32,000 for the lowest decile in 2010–2012, to up to around £113,000 for the richest households in 2014–2016, with an average for all households and waves of around £58,000. The value for the median household in the lowest decile in 2010–2012 was £25,000, whereas the value for the households at the top decile in 2014–2016 was £92,000, and the median value for the whole sample across waves was around £48,000.

The differences between the median and arithmetic average became more evident when looking at the property wealth of households (column 2). The property wealth of British households ranged in average from £112,000 for the lowest decile in wave 3 to up to £575,000 for the top decile in the last wave, with an average across waves and, for the entire sample, equal to around £223,000. Comparing these values with the median values highlights the asymmetries in the distribution of property wealth, as they were £79,000, £450,000, and £159,000, respectively. Clearly, the median values in all cases were considerably below the mean values.

Individual pension wealth is presented in column 3. The most staggering fact about pension wealth is that the median value for the lowest decile at wave 3 was close to £1,200, and it dropped to 0 for the subsequent waves, signaling a lack of pension wealth for at least half the population of the first decile (meaning 5% of the entire sample). Moreover, as with other measures of wealth, once again, there was a marked difference between the mean and median values for all deciles. Following previous examples, the average pension wealth for the first decile in 2010–2012 was around £33,000; for the top decile in 2014–2016, £332,000; and on average, for the entire sample, around £138,000. Substantially below are the reported values for the median household within every decile. The corresponding values for this example were £1,200, £130,000, and £34,000.

The final component of wealth is net financial wealth. Column 4 of tables [C.1](#) to [C.3](#) shows that net financial wealth for the average household at the lowest decile in 2010–2012 was £29,000, for the mean household at the top decile in 2014–2016

was £276,000, and on average for all waves and respondents was £90,000. The corresponding median values were £3,800, £124,000, and around £21,000. Once again it is clear that the average values were always higher than the median values, suggesting marked asymmetries and inequalities in the distribution of wealth across British households for all income deciles.

As reported in the tables, the average household in the first decile in 2010–2012 had a financial ratio of 24,600, meaning that the average household-financial-assets' value was 24,600 times the value of their short-term financial liabilities. Even for the median household at the lowest decile in 2010–2012, this value was around 1,500. For the top decile, the corresponding values for the mean and median household in 2014–2016 were around 219,000 and 33,000, respectively. For the mean and median households of the entire sample for all waves, these financial ratio values were 74,000 and 2,700, respectively. This makes even clearer the importance of conducting an analysis that accounts for these asymmetries across the income and wealth distributions. It is evident that there is a considerable fraction of households at risk, even though the median and average households seem financially sound, as one would expect in the United Kingdom.

Conversely, there was an interesting pattern that appeared with the financial ratio. Unlike with measures of wealth, the financial ratio did not increase linearly across the income distribution, as there were households close to the median overall income, for which the financial ratio decreased, compared with other respondents at the tails of the income distribution. This in turn indicates that there were households whose financial resilience was low that were not necessarily the poorest households in the data set.

Following, columns 6 to 8 of tables C.1 to C.3 present the well-being-measurement proxies in the data set. The variables used to proxy households' well-being were general health, satisfaction with life, and anxiety. The first well-being measure, presented in column 6, is general health. Two interesting patterns were observed for this variable. First, the intra-group value increased in each wave, suggesting that overall, all respondents' health was deteriorating, although this is most likely related to the general aging of the panel. The second pattern to emerge was that the inter-decile values of the self-reported general health decreased linearly, meaning they improved for households with higher incomes. However, for all waves and deciles, the median household reported having good general health (value equal to 2).

The next well-being measure, reported in column 7, is overall satisfaction with life. This measurement ranged from 0 to 10, with higher values signaling a higher

satisfaction. In line with what was found for general self-reported health, there seemed to be a linear pattern suggesting that households with higher incomes had higher satisfaction with life. For this variable, the median value for the lowest decile in the first two waves was lower than the median value was for the rest of the groups in all waves. Additionally, the level of satisfaction seemed to increase for all groups as time went on; however, this can reflect once again the aging pattern of the population in the panel more than changes in the average household's satisfaction level.

The final well-being measure, described in column 8, is the level of anxiety. The median level of anxiety was constant and very low for almost all deciles across waves and even dropped to 0 for three of the five lowest income deciles during the last wave. Nonetheless, there is still a downward trend across the income distribution that once again signaled the correlation between income and several measures of well-being. For all these measures in columns 6 to 8 of tables [C.1](#) to [C.3](#), the average values for all deciles are different from the median values and always suggest that the average household is worse off than the median household (i.e., worse health, lower satisfaction, and more anxiety). This reinforces the relevance of looking at households' behavior at different points of the variables' distributions.

The last variable presented in the descriptive statistics of the data set is the household's size. It is important to take this variable into consideration, as households' financial resilience will be affected by the families' income streams and expenses, which relate directly to the number of people who make up the household. The two main characteristics that the data exhibited were the intra-group variation across time and intergroup variation within each wave. For the former, the data showed no significant clear pattern and household size remained stagnant and even decreased somewhat for some groups. However, for the latter, there seemed a marked positive trend for household size, both for the average and median respondent. The tables implied that households with higher incomes were the biggest households, highlighting the relevance of controlling for this characteristic in the following exercises.

**Table C.1:** Mean and median of HH wealth, financial resilience, well-being, and size  
wave 3 WAS

	Physical	Property	Pension	Fin. net	Fin. ratio	Health	Satis.	Anxiety	HH size
less p.10	32105	112038	33038	28620	24663	2.41	6.95	2.92	1.51
	25000	79000	1168	3800	1472	2	7	1	1
p.10-20	37896	113949	47978	29797	27504	2.34	7.04	2.81	1.89
	29500	95000	8000	5419	1301	2	8	1	2
p.20-30	41167	128928	62098	40281	35355	2.23	7.32	2.67	2.20
	35500	105000	14636	9750	2001	2	8	1	2
p.30-40	45853	149579	85686	43110	38322	2.13	7.31	2.62	2.49
	38450	120000	16322	10784	1801	2	8	1	2
p.40-50	48529	163889	99642	57156	47966	2.06	7.38	2.66	2.60
	41000	139000	28897	15080	598	2	8	1	2
p.50-60	54074	196582	108482	61220	47796	1.90	7.52	2.53	2.85
	47700	150000	27802	20060	463	2	8	1	2
p.60-70	58236	213725	133810	85180	68800	1.88	7.56	2.64	2.85
	50400	166500	35257	31000	386	2	8	1	2
p.70-80	62669	229065	156061	99243	80404	1.81	7.74	2.30	2.97
	57000	182000	45087	31917	1001	2	8	1	3
p.80-90	72227	291697	179199	125338	97892	1.79	7.79	2.51	3.10
	63550	228000	56749	48000	515	2	8	1	3
more p.90	98122	478510	267167	244189	193537	1.69	7.98	2.45	3.15
	77000	370000	86009	111435	22401	2	8	1	3
Total	55031	207509	117107	81237	66091	2.04	7.44	2.62	2.56
	46000	150000	25799	18800	1381	2	8	1	2
Obs.	18774	18774	18773	18774	18774	15905	7336	7332	18773

The table presents the number of observations, mean, and median (P50) for the four measures of wealth (physical, property, pension, and net financial and its ratio), the physical and mental well-being, and household size.

**Table C.2:** Mean and median of HH wealth, financial resilience, well-being, and size  
wave 4 WAS

	Physical	Property	Pension	Fin. net	Fin. ratio	Health	Satis.	Anxiety	HH size
less p.10	33827	109984	34462	30273	27059	2.45	6.94	2.71	1.46
	25030	65250	1	3000	1326	2	7	1	1
p.10-20	38034	124593	54259	31713	29698	2.36	7.23	2.58	1.83
	35000	100000	10353	5589	3501	2	8	1	2
p.20-30	43242	141465	73378	45795	39892	2.22	7.49	2.53	2.23
	37000	112000	18324	10300	2531	2	8	1	2
p.30-40	47050	157961	98126	50647	44117	2.19	7.41	2.28	2.47
	40000	130000	23854	13940	3001	2	8	1	2
p.40-50	53542	180833	118935	58186	47092	2.04	7.57	2.46	2.59
	45300	145000	33575	19205	2539	2	8	1	2
p.50-60	57730	190357	138297	71176	57814	1.99	7.60	2.37	2.75
	50000	150000	46849	21667	1253	2	8	1	2
p.60-70	60713	222543	154290	91788	71900	1.91	7.70	2.53	2.86
	52800	170000	50936	32698	1345	2	8	1	3
p.70-80	67738	250459	194093	113722	94621	1.84	7.79	2.29	2.93
	59000	196000	75181	34000	4173	2	8	1	3
p.80-90	74384	308800	229569	146224	116272	1.81	7.83	2.26	3.07
	65750	230000	95150	55653	5090	2	8	1	3
more p.90	101342	482282	292303	263754	209433	1.74	7.93	2.09	3.19
	78700	375000	101035	114000	34501	2	8	1	3
Total	57724	216762	138612	90219	73701	2.07	7.53	2.42	2.54
	47600	151000	34379	20632	2901	2	8	1	2
Obs.	18773	18773	18773	18773	18773	16138	16127	16122	18773

The table presents the number of observations, mean, and median (P50) for the four measures of wealth (physical, property, pension, and net financial and its ratio), the physical and mental well-being, and household size.

**Table C.3:** Mean and median of HH wealth, financial resilience, well-being, and size wave 5 WAS

	Physical	Property	Pension	Fin. net	Fin. ratio	Health	Satis.	Anxiety	HH size
less p.10	32646	111168	35859	28094	26060	2.54	7.07	2.64	1.45
	25000	60000	0	2960	1301	2	8	1	1
p.10-20	40369	144603	56260	35865	32679	2.42	7.39	2.37	1.79
	35000	110000	10643	6376	3591	2	8	0	2
p.20-30	45466	155212	85846	45130	39513	2.31	7.48	2.40	2.07
	37500	125000	24972	11500	5001	2	8	0	2
p.30-40	51264	182432	118316	64901	55204	2.24	7.54	2.43	2.32
	45030	150000	45356	19400	6001	2	8	1	2
p.40-50	58459	208193	141850	75049	65322	2.08	7.72	2.26	2.53
	47520	160000	48339	27016	8001	2	8	0	2
p.50-60	59370	205348	155497	75103	62628	2.02	7.70	2.34	2.72
	50550	160000	58104	21851	3051	2	8	1	2
p.60-70	67649	261554	192132	97275	81547	1.95	7.87	2.28	2.80
	62000	200000	80870	31750	4227	2	8	1	2
p.70-80	72034	273323	219901	131966	107382	1.84	7.90	2.26	3.04
	64500	213000	91177	33860	1052	2	8	1	3
p.80-90	82862	337493	259219	151316	122819	1.85	7.95	2.23	3.12
	70500	271500	107206	56091	1201	2	8	1	3
more p.90	112512	575120	331728	276297	219356	1.79	8.07	2.21	3.20
	91500	450000	129768	123900	33101	2	8	1	3
Total	62208	245189	159430	97947	81131	2.12	7.65	2.35	2.50
	50000	175000	42714	22310	3720	2	8	1	2
Obs.	18773	18773	18773	18773	18773	16265	16252	16252	18773

The table presents the number of observations, mean, and median (P50) for the four measures of wealth (physical, property, pension, and net financial and its ratio), the physical and mental well-being, and household size.

## C.2 Detailed method comparison

Table C.4 reports the method comparison for the estimation of the probability of keeping up with bills. The panel fixed-effects LPM in column (1) shows that the effect of an increase of 1 in the financial resilience measure resulted in an increase of 0.83 pp in the probability of households keeping up with bills. In this case, the baseline estimated probability was 66.93%. For all methods compared in this exercise, the estimated coefficients were positive and statistically significant at the 1% level of significance. Columns (2) and (3) arrived at virtually the same conclusion. There was an effect of 0.95 pp after an increase of 1 in the logarithmic short-term financial

ratio, which is somewhat higher than the first LPM. The predicted probability for these methods was also slightly higher, at 66.99%. Contrary to the LPM, the two first IM, depicted in columns (4) and (5), showed a slightly lower effect, 0.82 pp on the probability of keeping up with the bills, after an increase in the variable of interest. In these cases, the predicted probability was somewhat higher than before, at 67.04%. Finally, the fixed-effects panel logistic IM reported an effect of a considerably larger magnitude, 1.5 pp, almost twofold the average of the effect across the other methods. In this case, the sample size fell around 80%, thus focusing on households that were close to the threshold of keeping up or not with their obligations. For these households, monitoring closely their financial resilience proxy can be of particular interest.

Moving on, table C.5 presents the results for the method comparison of the probability of ending the period with no money. For all methods analyzed in this table, the coefficient of interest had a negative and significant ( $p\text{-value} < 0.01$ ) effect on the binary-response dependent variable. In this case, the coefficient calculated for the three LPM was very similar, at around -1.26 pp, and in all methods, the predicted probability was close to 21% (except for the fixed-effects panel logit, which had a predicted probability of 34.53%). The two first IM, in columns (4) and (5), reported an effect of -0.99 pp on the probability of running out of money before the end of the period, which was less than any of the three LPM. The last method, in column (6), had the biggest effect once again. In this case, an increase in 1 in the logarithmic financial ratio generated a decrease of 2.18 pp in the probability of occurrence of the event under analysis. As is typical, the sample size shrunk more than 60% compared with that of the other methods.

Finally, table C.6 covers the output for the method comparison around the probability of ending the period with a positive cash balance. In this particular case, the coefficients estimated using the six methods under analysis showed the lowest variation among all previous tables. Once again, all results were statistically significant at the 1% level, and in this case, all had a positive magnitude. Column (1) encloses the results for the fixed-effects panel LPM, showing an increase of 1.09 pp after an increase of 1 in the short-term households' financial ratio. The hybrid random-effects and correlated-random-effects panel models in columns (2) and (3) arrived at a coefficient of 1.13 pp, slightly higher than the previous LPM. Columns (4) and (5) found a coefficient of 1.06 pp for the hybrid random-effects and correlated-random-effects panel probits, this time slightly lower than the results of the first column. The last column contains the coefficients for the panel fixed-effects logistic model, with the highest coefficient around 40% higher than the others, at 1.42 pp. In addition, this

method dropped more than 50% of the observations. In this table, all methods had a predicted probability of around 54%, except for column (6), where this probability spiked to around 73%.



**Table C.4:** Probability of keeping up with bills - method comparison

	(1)	(2)	(3)	(4)	(5)	(6)
	XT Fixed Effects	XT Hybrid RE	XT Corr. RE	XT Prob. Hybrid RE	XT Prob. Corr. RE	XT Logit FE
Fin. Assets/Liab.	0.00832*** (0.001)		0.00951*** (0.001)		0.00815*** (0.001)	0.0150*** (0.002)
Fin. Assets/Liab. (centered)		0.00951*** (0.001)		0.00815*** (0.001)		
Mean of Fin. Assets/Liab.		0.0452*** (0.000)	0.0357*** (0.001)	0.0404*** (0.000)	0.0323*** (0.001)	
Constant	0.577*** (0.007)	0.344*** (0.005)	0.344*** (0.005)			
Predicted probability	0.6693	0.6699	0.6699	0.6704	0.6704	0.6724
Observations	31609	31609	31609	31609	31609	6246
Within R <sup>2</sup>	0.0343	0.0342	0.0342			
Between R <sup>2</sup>	0.257	0.283	0.283			
Overall R <sup>2</sup>	0.156	0.234	0.234			

Clustered standard errors in parentheses. Column (1) presents the results from the LPM using panel fixed effects regressions. Column (2) reports the results of the random-effects panel hybrid LPM, in which the independent variable is not entered in its levels, but as a standardized form, separating it into the centered variable and its mean across time for each agent (Jann, 2017). Column (3) shows the output of the LPM Mundlak-Chamberlain correlated-random-effects panel regression, in which the variable of interest is entered both in its levels and additionally as the mean for each panel across all waves. Column (4) depicts the marginal effects, which are the partial derivatives of  $P(\cdot)$  with respect to  $\log(\text{Fin Ratio})_{it}$  (centered and mean), from the random-effects hybrid probit IM. Column (5) presents the marginal effects from the Mundlak-Chamberlain correlated-random-effects panel probit IM. Finally, column (6) reports the marginal effects from the fixed-effects panel logistic IM, in which only observations for agents that reported both values in the response variable are used. All regressions included wave time effects that were not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table C.5:** Probability of ending period with no money - method comparison

	(1)	(2)	(3)	(4)	(5)	(6)
	XT Fixed Effects	XT Hybrid RE	XT Corr. RE	XT Prob. Hybrid RE	XT Prob. Corr. RE	XT Logit FE
Fin. Assets/Liab.	-0.0125*** (0.001)		-0.0126*** (0.001)		-0.00999*** (0.001)	-0.0218*** (0.001)
Fin. Assets/Liab. (centered)		-0.0126*** (0.001)		-0.00999*** (0.001)		
Mean of Fin. Assets/Liab.		-0.0395*** (0.000)	-0.0269*** (0.001)	-0.0334*** (0.000)	-0.0234*** (0.001)	
Constant	0.319*** (0.005)	0.491*** (0.005)	0.491*** (0.005)			
Predicted probability	0.2091	0.2099	0.2099	0.2100	0.2100	0.3453
Observations	48128	48128	48128	48128	48128	13040
Within R <sup>2</sup>	0.0263	0.0263	0.0263			
Between R <sup>2</sup>	0.333	0.341	0.341			
Overall R <sup>2</sup>	0.205	0.238	0.238			

Clustered standard errors in parentheses. Column (1) presents the results from the LPM using panel fixed effects regressions. Column (2) reports the results of the random-effects panel hybrid LPM, in which the independent variable is not entered in its levels, but as a standardized form, separating it into the centered variable and its mean across time for each agent (Jann, 2017). Column (3) shows the output of the LPM Mundlak-Chamberlain correlated-random-effects panel regression, in which the variable of interest is entered both in its levels and additionally as the mean for each panel across all waves. Column (4) depicts the marginal effects, which are the partial derivatives of  $P(\cdot)$  with respect to  $\log(\text{Fin Ratio})_{it}$  (centered and mean), from the random-effects hybrid probit IM. Column (5) presents the marginal effects from the Mundlak-Chamberlain correlated-random-effects panel probit IM. Finally, column (6) reports the marginal effects from the fixed-effects panel logistic IM, in which only observations for agents that reported both values in the response variable are used. All regressions included wave time effects that were not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table C.6:** Probability of ending period with money - method comparison

	(1)	(2)	(3)	(4)	(5)	(6)
	XT Fixed Effects	XT Hybrid RE	XT Corr. RE	XT Prob. Hybrid RE	XT Prob. Corr. RE	XT Logit FE
Fin. Assets/Liab.	0.0109*** (0.001)		0.0113*** (0.001)		0.0106*** (0.001)	0.0142*** (0.001)
Fin. Assets/Liab. (centered)		0.0113*** (0.001)		0.0106*** (0.001)		
Mean of Fin. Assets/Liab.		0.0412*** (0.000)	0.0299*** (0.001)	0.0392*** (0.000)	0.0286*** (0.001)	
Constant	0.399*** (0.005)	0.208*** (0.005)	0.208*** (0.005)			
Predicted probability	0.5448	0.5440	0.5440	0.5434	0.5434	0.7276
Observations	47950	47950	47950	47950	47950	19316
Within R <sup>2</sup>	0.0425	0.0425	0.0425			
Between R <sup>2</sup>	0.233	0.251	0.251			
Overall R <sup>2</sup>	0.130	0.183	0.183			

Clustered standard errors in parentheses. Column (1) presents the results from the LPM using panel fixed effects regressions. Column (2) reports the results of the random-effects panel hybrid LPM, in which the independent variable is not entered in its levels, but as a standardized form, separating it into the centered variable and its mean across time for each agent (Jann, 2017). Column (3) shows the output of the LPM Mundlak-Chamberlain correlated-random-effects panel regression, in which the variable of interest is entered both in its levels and additionally as the mean for each panel across all waves. Column (4) depicts the marginal effects, which are the partial derivatives of  $P(\cdot)$  with respect to  $\log(\text{Fin Ratio})_{it}$  (centered and mean), from the random-effects hybrid probit IM. Column (5) presents the marginal effects from the Mundlak-Chamberlain correlated-random-effects panel probit IM. Finally, column (6) reports the marginal effects from the fixed-effects panel logistic IM, in which only observations for agents that reported both values in the response variable are used. All regressions included wave time effects that were not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$